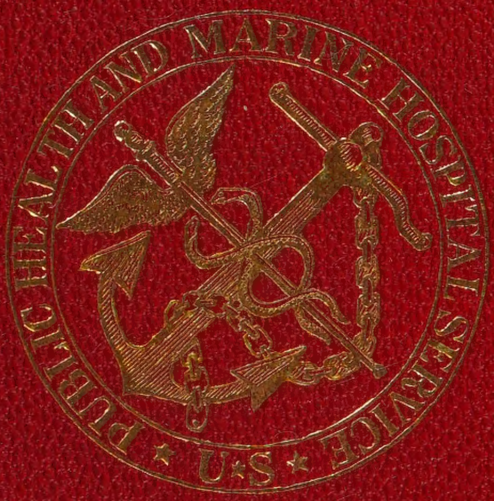
PUBLIC HEALTH AND MARINE HOSPITAL SERVICE
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THE ROYAL SANITARY INSTITUTE, FOUNDED 1876.
SALUS GENERIS HUMANI.

Presented by

The Surgeon General

May 1911

22502972548

ANNUAL REPORT OF THE

Surgeon General of the Public Health and Marine-Hospital Service of the United States

FOR THE FISCAL YEAR

1910

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OPERATIONS

OF THE

UNITED STATES PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE

1910

ERRATA.

ANNUAL REPORT OF THE SURGEON-GENERAL, PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE, 1910.

Page 31: Lines 5, 6, and 7 from top of page should read:

> Cases have been found in 25 States and in the District of Columbia. Amebæ have been cultivated in various localities from vegetables and from water used for drinking purposes.

Page 230: "General paralysis of the insane" should read:

> Treated at dispensary, 1 case.
> Total treated at hospital and dispensary, 12 cases.

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LETTER OF TRANSMITTAL.

Treasury Department,
Office of the Secretary,
Washington, January 21, 1911.

Sir: In accordance with section 9 of the act of Congress approved July 1, 1902, entitled "An act to increase the efficiency and change the name of the Marine-Hospital Service," I have the honor to transmit herewith the annual report of the Surgeon General of the Public Health and Marine-Hospital Service of the United States for the fiscal year 1910.

Respectfully,

Franklin MacVeagh,
Secretary.

The Speaker of the House of Representatives.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

Treasury Department,
Bureau of Public Health and
Marine-Hospital Service,
Washington, D. C., January 20, 1911.

Sir: I have the honor to submit for transmission to Congress, in accordance with the act of July 1, 1902, the following report of the transactions of the Public Health and Marine-Hospital Service of the United States for the fiscal year ended June 30, 1910, together with some subsequent transactions of especial importance, this being the thirty-ninth annual report of the service in the one hundred and twelfth year of its existence and the ninth annual report under its present name.

Divisions of Bureau.

The operations of the service are conducted through the seven divisions of the bureau at Washington—namely, "Scientific Research and Sanitation," "Foreign and Insular Quarantine and Immigration," "Domestic (Interstate) Quarantine," "Sanitary Reports and Statistics," "Marine Hospitals and Relief," "Personnel and Accounts," and "Miscellaneous." Each division is in charge of a medical officer of the service. All officers and employees in the outside service are within the jurisdiction of one or other of these divisions, whose functions are coordinated and whose operations are under the direct supervision of the Surgeon General in accordance with special bureau regulations.

Amendments to Service Regulations.

Under the date of March 23, 1910, and with the approval of the Secretary of the Treasury and the President, paragraphs 422, 438, and 761, Service Regulations, approved August 12, 1903, were amended to read as follows:

Par. 422. Masters of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessels a certificate, Form 1915, of the length of time said seaman has been so employed, giving the dates of such employment. This certificate will be filed in the Marine-Hospital office or office of the customs officer when application is made for relief, if relief is furnished.

Par. 438. When an applicant's claim for relief is rejected a copy of the master's certificate or other papers in the case must be made and the cause or causes of rejection indorsed on said copy or copies, which shall then be placed on file at the station.

Par. 761. The chiefs of divisions of Chemistry, Pharmacology, and Zoology shall hereafter be designated as professors of chemistry, pharmacology, and zoology, respectively, and their pay shall be a sum equal to the pay and allowances now received by the professors on active duty at the Military Academy at West Point: *Provided*, That they shall have actual and necessary traveling expenses, and not mileage, when traveling under official orders and shall not be entitled to retirement pay.

SCIENTIFIC RESEARCH AND SANITATION.

The activities of the service in relation to scientific research have been continued, but have covered a larger field than heretofore, as shown by the increased number of publications issued. This work has been carried on through the division of scientific research, having the administrative supervision over the several laboratories of the service. A number of important public health problems have received consideration, some of them having been continued from previous years, and others taken up in response to demands for more definite knowledge of improved sanitation.

The great interest now taken in public-health matters throughout the country has not only enlarged the scope of the investigations, but emphasized the fact that scientific research in relation to preventive medicine is one of the most important functions devolving on the Federal Government. This applies particularly to the investigations of infectious and contagious diseases, the conditions favoring their spread, and the measures necessary for their prevention. Such investigations have both a protective and a developmental value and react favorably on the country as a whole by furnishing the basis for the exercise of police powers. On account of the large number of public-health problems demanding solution, it is evident that there must be a wise selection of those to receive attention, and regard must be had for the limitation of the number of workers available for this purpose.

In no better way can the Federal health service advance sanitary administration than by research and the dissemination of the knowledge thus acquired. The most urgent needs at the present time, therefore, are the enlargement of the personnel engaged in this work, the extension of authority to permit of field investigations, and an increase of appropriations to carry them on and publish the results.

With the funds available during the past fiscal year the facilities of the laboratories have been maintained. Greater specialization has been encouraged as being necessary in the growth of scientific work. Some important changes have been made in the personnel by reason of changes of station and resignations. Surg. M. J. Rosenau, director of the Hygienic Laboratory, resigned October 1, 1909, and Passed Asst. Surg. John F. Anderson, assistant director, was promoted to fill this vacancy. The director of the leprosy investigation station also resigned during the year and Passed Asst. Surg. D. H. Currie, who had given special attention to the subject of leprosy, was made director. Two officers were detailed to the Hygienic Laboratory for purposes of instruction, and are now on duty there.

Some of the investigations begun in previous years have been completed and the results published either as Hygienic Laboratory

Bulletins, Public Health Bulletins, or in the weekly Public Health reports. In response to demands made upon it, the service has been represented at a larger number of meetings of scientific and sanitary associations than heretofore. An increasing number of addresses have been given by the officers, and contributions made to scientific and other publications. An important function has been the cooperation with State and municipal authorities, a number of the investigations having been made upon their requests. In addition, the facilities of the Hygienic Laboratory were extended for a limited period to certain State and other health authorities, thus enlarging the influence of that institution.

The number and organization of the service laboratories remain the same. On account of the importance of excluding exotic diseases and in order to gain more efficiency in recognizing them there is necessity for the establishment of a research laboratory in connection with the medical inspection and care of aliens arriving at the port of New York. Aliens arrive at that port from all quarters of the globe, and in no place in this country is there a greater variety of ailments encountered, especially tropical diseases. This clinical material should be utilized for purposes of study, both from research and statistical standpoints. Such material could also be used with advantage in connection with the work of the Hygienic Laboratory, which is at present without hospital facilities.

Authority to admit into marine hospitals cases of contagious and infectious diseases for scientific purposes would be a valuable aid in the conduct of scientific research. By this means there could be undertaken at certain hospitals special investigations of those communicable diseases that from time to time menace the country, and the hospital work would go hand in hand with the work being conducted in the Hygienic Laboratory.

The personnel of the administrative Division of Scientific Research in the bureau has been increased by the addition of one assistant, whose time has been devoted almost wholly to the assembling and compiling of public-health laws, with the view to their publication. In order to enlarge the scope of the work that should be done, there is urgent need for more assistance, and at least two clerical assistants should be provided for in the immediate future.

The subjects that have received attention during the past year through the division and laboratories are as follows: Supervision of viruses, serums, toxins, and analogous products; investigation of typhoid fever in the District of Columbia, Omaha, Nebr., and Williamson, W. Va.; rabies and antirabic treatment; inquiry as to the origin and prevalence of leprosy in Michigan; studies on tuberculosis; investigations of an outbreak of smallpox in Berkeley Springs, W. Va.; studies on typhus fever in the City of Mexico; studies on disinfectants and embalming fluids; studies on the disposal of night soil, especially with reference to the viability of protozoan and bacterial organisms; studies of health conditions on farms; work in relation to the Pharmacopœia and pharmaceutical preparations; studies on anaphylaxis and immunity; investigations of hookworm disease; standardization of digitalis and epinephrin; work on the pharmacology of the thyroid gland; studies to determine the possible injurious effects of bleached flour upon man; investigations on leprosy and pellagra; sanitary inspections of Government buildings; investigations on mercury-vapor illumination as affecting vision; compilation of national, State, and Territorial health laws; compilation of statistics regarding milk charities; cooperation with the American Medical Association and medical colleges; preparation and publication of scientific and practical public-health bulletins; conferences with State and Territorial health authorities; and work in relation to international sanitation.

Supervision of Viruses, Serums, Toxins, and Analogous Products.

The administration of the act approved July 1, 1902, governing the manufacture, barter, and sale of viruses, serums, toxins, and analogous products has been continued as in previous years. During the fiscal year 11 establishments were relicensed and four additional laboratories were inspected and licensed. Three establishments were refused licenses. One establishment was refused a license for tuberculin on account of contamination of the samples of the product examined, and one because the product was not made in their laboratory. In the third instance the issue of a license for antitetanic serum was suspended because the samples submitted were not standardized in accordance with the American method.

Samples of the licensed products were purchased in the open market and examined in the Hygienic Laboratory to determine their purity and potency. With one or two exceptions, these examinations have shown the products to be free from contamination, and those capable of standardization have been found to meet the standard adopted by the department. In accordance with regulations issued May 11, 1909, under the above-mentioned law, viruses, serums, toxins, and analogous products propagated in licensed establishments and imported from abroad have been detained by customs officers at ports of entry until samples of such products have been examined in the Hygienic Laboratory as to purity and potency. In addition, certain shipments from abroad of unlicensed products have been refused entry.

The following is a list of the establishments holding licenses June 30, 1910, and the products for which each is licensed:

No. of license.	Establishment.	Products.
1	Parke, Davis & Co., Detroit, Mich	Antidiphtheric serum, antitetanic serum, antigonococcic serum, antistreptococcic serum, antitubercle serum, tuberculins, bacterial vaccines, erysipelas and prodigiosus toxins (Coley), and vaccine virus.
2	H. K. Mulford Co., Philadelphia, Pa	Antidiphtheric serum, antitetanic serum, antistreptococcic serum, antipneumonic serum, antigonococcic serum, antidysenteric serum, antimeningococcic serum, tuberculins, bacterial vaccines, and vaccine virus.
3	Dr. H. M. Alexander & Co., Marietta, Pa.	Antidiphtheric serum, antirabic virus, vaccine virus, and tuberculins.
5	Fluid Vaccine Co., Milwaukee, Wis	Vaccine virus.
8	The Cutter Laboratory, Berkeley, Cal.	Antidiphtheric serum, antistreptococcic serum, tuberculin, bacterial vaccines, and vaccine virus.
9	Frederick Stearns & Co., Detroit, Mich.	Antidiphtheric serum, streptolytic serum, and pneumolytic serum.
11	Pasteur Institute of Paris, Paris, France.	Antidiphtheric serum, antistreptococcic serum, antiplague serum, antidysenteric serum, antimeningococcic serum, and sérum antivenimeux.
12	Chemische Fabrik auf Actien (vorm. E. Schering), Berlin, Germany.	Antidiphtheric serum and antistreptococcic serum.
14	Health Department of the city of New York.	Antidiphtheric serum and antitetanic serum.

No. of license.	Establishment.	Products.
15	Dr. W. R. Hubbert Serum Laboratory, Detroit, Mich.	Antidiphtheric serum.
16	National Vaccine & Antitoxin Institute, Washington, D. C.	Antidiphtheric serum, antigonococcic vaccine, vaccine virus, and normal horse serum.
17	Lederle Antitoxin Laboratories, New York City.	Antidiphtheric serum, antitetanic serum, antistreptococcic serum, suspension of lactic acid bacilli, and vaccine virus.
18	Burroughs, Wellcome & Co., London, England.	Antidiphtheric serum, antigonococcic serum, antistreptococcic serum, antistaphylococcic serum, antityphoid serum; antistreptococcic vaccine, antistaphylococcic vaccine, antigonococcic vaccine, and antityphoid vaccine.
19	Memorial Institute for Infectious Diseases, Chicago, Ill.	Antidiphtheric serum.
21	Swiss Serum and Vaccine Institute, Berne, Switzerland.	Antidiphtheric serum, antidysenteric serum, antipneumococcic serum, antimeningococcic serum, antiplague serum, antistreptococcic serum, anticholera vaccine, antiplague vaccine, antityphoid vaccine, and tuberculins.
22	Institut Bacteriologique de Lyon, Lyons, France.	Antidiphtheric serum and normal goat serum.
23	Bacterio-Therapeutic Laboratory, Asheville, N. C.	Tuberculins.
24	Farbwerke, vormals Meister Lucius & Brüning, Hoechst-on-Main, Germany.	Antidiphtheric serum, antistreptococcic serum, antidysenteric serum, antitetanic serum, antimeningococcic serum, and tuberculins.
25	Tuberculin Society of St. Petersburg, St. Petersburg, Russia.	Tuberculinum purum.
26	Institut de Vaccine Animale, Paris, France.	Vaccine virus.
27	Institut Pasteur de Lille, Lille, France.	Sérum antivenimeux.
28	Bacteriologisches Institut Lingner, Dresden, Germany.	Pyocyanase.
29	The Behringwerk, Marburg, Germany..	Antitetanic serum and tuberculin.
30	Dr. G. H. Sherman, Detroit, Mich......	Bacterial vaccines.
31	E. Merck, Darmstadt, Germany........	Antidiphtheric serum, normal horse serum (dried), normal horse serum, antimeningococcic serum, antipneumonic serum, and antistreptococcic serum.
32	Kalle & Co., Biebrich, Germany........	Tuberculin (Rosenbach).

The preparation of the standard units for antitetanic and antidiphtheric serum has been continued in the Hygienic Laboratory and standard units sent out bimonthly to licensed establishments and others concerned. Information has been received that the American unit prepared in the Hygienic Laboratory has been officially adopted by the Belgian Government as one of the methods for the standardization of antitetanic serum. This unit is also used by the Wellcome Laboratories in England for the standardization of their antitoxin and by the Brazilian Government for the same purpose. The continued use of the unit by the manufacturers has emphasized the great value and accuracy of the unit for the measurement of the potency of antitetanic serum. The establishment of this unit has been considered by some as one of the most important achievements of the laboratory.

The laboratory has now under consideration the question of the recommendation of the adoption of a standard for the control of antimeningococcic serum.

It has long been realized that there is a great necessity for the standardization of tuberculin. There has been some work done in the Hygienic Laboratory upon this subject, but without satisfactory results. It is expected in the ensuing year to take up the question of the standardization of tuberculin and endeavor to establish a satisfactory method for this therapeutic and diagnostic preparation.

The Director of the Laboratory believes that the establishment of a standard for Koch's old tuberculin will not be a difficult matter, but doubts whether it would be wise to endeavor to standardize some of the other preparations of tuberculin, such as those used for the ophthalmic test and certain watery extracts of the tubercle bacillus.

On September 28, 1909, the secretary of the State Board of Health of Illinois forwarded for examination samples of diphtheria antitoxin furnished to that board. The antitoxin in question had become turbid and evidently undergone some change, and on examination the Director of the Hygienic Laboratory reported that it was slightly turbid and of a dark color. Cultures and animal inoculations were made from the serum. From the cultures a streptococcus was isolated in pure culture which, however, was without virulence for laboratory animals, and the animal inoculated with the serum remained well.

Immediately upon the receipt of the serum the establishment manufacturing the same was communicated with and requested to submit other samples of the same laboratory number for examination. It was found that they were dark in color and contaminated. As a result of these findings this establishment was required to withdraw from the market all of the serums represented by these samples. As an additional safeguard over the propagation of antidiphtheric serum the establishment was required, on October 19, 1909, to submit for examination samples of each laboratory number of serum produced in the future, and an inspector was ordered to visit the laboratory and carefully examine the methods of manufacture and records kept.

The special care taken was recognized as necessary not only in the interest of the public, but of the manufacturers as well, as they were informed that their products must be absolutely free from contamination.

On May 10, 1910, the Director of the Hygienic Laboratory reported that in the examination of a number of samples of diphtheria antitoxin from one establishment samples of two laboratory numbers were found to be contaminated. This establishment was immediately informed of the reported contamination and that the antitoxin represented by the contaminated samples should not be offered for sale in interstate traffic, and that all packages of these two numbers being offered for sale in different parts of the country must be withdrawn from the market. In addition, the director was detailed to make an inspection of the establishment and render a report of the conditions found, together with specific data as to the disposition of the contaminated serums that were being withdrawn from the market. Examination of the laboratory records of the establishment showed that both lots of serum had been examined for sterility, and in every instance the serum was found to have been sterile, except one lot, examined January 5, 1910, of 132 syringes. The same records showed that these syringes had been emptied and the serum refiltered.

The action of the establishment in withdrawing the serum was prompt and successful. Letters were sent to all persons to whom the two lots of serum had been consigned, and a representative visited the various boards of health which had been supplied with the condemned serum and personally attended to its withdrawal. In a letter bearing date of June 7, 1910, the establishment reported that the last package of diphtheria antitoxin of the two laboratory numbers had been accounted for and withdrawn from the market. The withdrawal of these serums from the market was a cause of much inconvenience and expense, and the establishment deserves credit for its prompt and ready acquiescence in the matter.

INVESTIGATIONS OF TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

In the annual report for 1909, page 39, reference was made to investigations of typhoid fever, which had been carried on by a board of officers appointed for that purpose in July, 1906. These investigations were continued during the year 1909. Certain changes in the personnel of this board became necessary. Prof. Joseph H. Kastle, chief of the Division of Chemistry and recorder of the board, resigned September 30, 1909, to accept a professorship in the University of Virginia. Surg. M. J. Rosenau, chairman, was granted leave of absence and later resigned to accept a professorship in the department of preventive medicine and hygiene of the Harvard Medical School. Passed Asst. Surg. L. L. Lumsden was made chairman and Passed Asst. Surg. John F. Anderson a member of the board.

The studies made in the fourth year (1909) of the investigation comprised an epidemiological investigation of all cases reported to the health office during the whole calendar year; systematic bacteriological examinations of water from (1) the Potomac River as the water entered the first sedimentation reservoir (Dalecarlia), (2) the effluent from the last sedimentation reservoir (Washington City) as it was applied to the filtration beds, (3) the effluent from the storage reservoir for the filtered water just as it entered the conduits for distribution to the city, and (4) various taps in the city; a clinical and laboratory study of about 100 cases reported as typhoid fever to determine the average percentage of error in diagnosis; bacteriological examinations of specimens of feces and urine from about 300 persons who had had typhoid fever within the 10 years previous in order to determine what percentage of those recovered from typhoid are bacillus carriers; a particular study of the general food supply, sanitary conditions, etc.

These studies were more complete than those made in previous years, inasmuch as they were continued throughout the whole calendar year instead of during the typhoid-fever season (May 1 to November 1) only.

The manuscript of the report (No. 4) is now in course of preparation. It is anticipated that these investigations, when considered in connection with the data collected in the three previous years, will furnish evidence which will point to reasonably definite conclusions as to the causes of the prevalence of typhoid fever in the District of Columbia, and that the fourth report will terminate the labors of the board on the immediate typhoid-fever situation in Washington.

INVESTIGATION INTO THE ORIGIN AND PREVALENCE OF TYPHOID FEVER IN OMAHA, NEBR.

In the latter part of November, 1909, there was reported an undue prevalence of typhoid fever in Omaha, Nebr., which continued until the latter part of March, 1910. From December 1, 1909, to April

1, 1910, 582 cases of typhoid fever were reported in that city with 59 deaths. This gave a death rate from typhoid fever during that period over six times as high as the average rate for the corresponding period of the five years previous, and, so far as known, much higher than it had ever been during this period in any previous year.

The undue prevalence of the disease caused alarm among the public, and as suspicion had fallen upon the water supply, the city commissioner of health advised the boiling of water used for drinking or culinary purposes. Owing to differences of opinion as to the origin of the infection, the local medical society petitioned the governor of the State to use his influence to secure a thorough investigation of the situation by an officer of this service. The governor accordingly sent a letter to the department March 4, 1910, asking for the services of a competent officer to study the situation, and Passed Asst. Surg. L. L. Lumsden was sent to Omaha for a conference with the commissioner of health, and directed to make investigations of the origin and prevalence of typhoid fever, especially in relation to the water supply.

The investigation was begun March 28 and completed April 23. It included a sanitary survey of the Missouri River watershed from Omaha to points about 10 miles north of the first intake for the city's water supply; bacteriological examinations of the water supply; an epidemiological study of 105 cases of typhoid fever reported between March 1 and April 15; a clinical examination of about 50 cases reported as having typhoid fever; blood cultures and Widal tests in a number of cases, to aid in the determination of the clinical diagnosis; an inspection of the principal dairy; a study of the health-office records; an inquiry into the prevalence of typhoid fever in neighboring towns and cities; and a careful investigation of the city's sewerage system and the supply of foods and beverages generally.

As a result of his studies Dr. Lumsden arrived at the following conclusions, which are contained in the special report published as a hygienic laboratory bulletin (No. 72):

Prevalence.—In the period from November 25, 1909, to March 25, 1910, typhoid fever prevailed in Omaha in epidemic form. The rate of occurrence during this period was one case to about every 225 inhabitants, and, so far as the records show, was over six times as high as the average rate for corresponding periods in previous years.

Age.—The disease was distributed quite generally through the population. The majority of the cases occurred in persons between 10 and 30 years of age. The disease was not especially prevalent among children.

Geographic distribution.—The disease was generally distributed through the city. The rate of prevalence was, so far as could be ascertained, somewhat higher among persons whose residences were connected with the city water, supplied from the Missouri River, than among those whose residences were supplied from other sources; and was particularly high among persons habitually exposed to conditions in an eastern section of the city in which practically all of the water from the Burt Street station was distributed.

Diagnosis.—The evidence is convincing that at least 85 or 90 per cent of cases reported as typhoid fever during the outbreak were correctly reported as such, and that the number of actual cases not reported was fully as large as the number reported as typhoid fever under erroneous diagnoses.

Imported cases.—Not over 5 per cent of the persons affected contracted the infection while away from the city of Omaha. This number was more than offset by the number of cases in persons who contracted the infection in Omaha and developed the disease elsewhere.

Ice.—Very few of the persons affected during the period of the outbreak gave a history of having used ice in foods or beverages during the 30 days prior to onset of illness, and ice may therefore be eliminated as having been any considerable factor in the production of the outbreak. But as a large proportion of the ice used in Omaha is that which was harvested from the river and other polluted water, this ice may become, upon the advent of warm weather and the consequent increased use of ice in foods and beverages, an important source of infection.

Milk and ice cream.—Milk, ice cream, and other dairy products were not important factors in the production of the outbreak.

Raw shellfish.—As only a small proportion of the cases gave a history of having eaten raw oysters or clams during the 30 days prior to onset of illness, these shellfish could have played but a small part, if any, in the spread of the infection.

Raw vegetables.—It is quite probable that neither lettuce nor celery could have played a major part in the production of the outbreak.

Bakery products and other general food supplies.—It is reasonable to believe that bakery products and other general food supplies played only a secondary and relatively small part in the production of the outbreak.

Dust.—In view of the fact that the ground at Omaha was covered with snow during the greater part of the period in which the outbreak occurred, and in view of the general epidemiological features of the epidemic, it is not reasonably conceivable that it could have been caused by infection disseminated in air-borne dust.

Sewage disposal and general sanitary conditions.—As the majority of the cases investigated were found to be among persons living at residences connected with the city sewerage system, and at which the general sanitary conditions were good, or fairly good, it appears that whatever factors were concerned in the production of the outbreak were not dependent for their operation upon insanitary conditions at places of residence of persons affected.

Contact.—About 13 per cent of the cases investigated gave a history of association during the 30 days prior to onset of illness, with previous cases in the febrile stage of the disease and were attributable to infection by personal contact. It appears, therefore, that in Omaha, as is generally true for other places where typhoid fever prevails, personal contact was an important factor in the spread of the infection, but the evidence is abundant and convincing that in this outbreak personal contact operated as a factor secondary to some other factor that was chief and primary.

Water.—The unusually high rate of prevalence or outbreak of typhoid fever in Omaha during the period extending from about November 25, 1909, to about March 25, 1910, was beyond reasonable doubt caused by pollution of the water supply obtained from the Missouri River. Some of the points in the evidence on which this conclusion is based are as follows:

(*a*) The river water obtained at both intakes was polluted to a dangerous degree with sewage.

(*b*) The results of the bacteriological examinations show that during the period in which this outbreak was caused the treatment of the water by storage previous to its distribution to the city and the use of a coagulant was not efficient to render this water reasonably free from dangerous pollution.

(*c*) Over 95 per cent of the 103 cases particularly investigated were in persons who, during the 30 days prior to onset of illness, used as the sole, principal, or occasional source of water for drinking purposes the unboiled and unfiltered tap water as supplied from the river through the city water system, and besides this water there was no factor common to the majority of the cases which could reasonably be considered as having been concerned in the production of the disease.

(*d*) There was a parallelism between the occurrence of certain unusual climatic conditions which particularly affected the river water and the unusual prevalence of typhoid fever, which very strongly suggests a relationship of cause and effect.

(*e*) Reports from a number of other cities for the period in which the outbreak at Omaha occurred showed that in those cities which were using water from the Missouri River the typhoid fever rates generally were unusually high, while in neighboring cities using water from other sources such as wells, springs, lakes, etc., the typhoid fever rates generally were not unusually high.

(*f*) Among persons who habitually used for drinking the water distributed from the Burt Street station, which water in the winter of 1909–10 was certainly exposed to greater sewage pollution than it had been in any other winter for many previous years and to relatively more sewage pollution from near-by sources than was the water distributed from the Florence intake, the disease appeared to prevail at a rate which was disproportionately high.

(*g*) The time of occurrence and the extent of the outbreak point to the water supply as the source of infection.

(*h*) The results of the investigation eliminate beyond reasonable doubt all possible sources of infection other than the water supply which could have been responsible for an outbreak of such character.

Upon the completion of the investigations, on April 23, Dr. Lumsden submitted a preliminary report to the commissioner of health of Omaha, which embodied also certain recommendations. His recommendations, as contained in the report to be published, are as follows:

1. *The improvement of the water supply obtained from the Missouri River.*—Of the measures required to make this water free from dangerous pollution, the following are indicated:

(*a*) The abandonment of the intake at the Burt Street Station as soon as practicable. This is particularly advisable, even if the water supply is to be subjected to purification processes much more efficient than those which have been and are now in operation, because the water at this intake is polluted not only with sewage in the river from more distant sources, but also with the sewage from Florence, and from a northwest section of the city of Omaha, having a population of several thousand, and, at times of high water, with the contents of privies located within a few hundred feet of the intake. There is also also contamination of the water at this point by drainage from the dumping ground of Council Bluffs, Iowa, on the east side of the river. None of the processes usually adopted as practicable for the improvement on a large scale of polluted surface river water should be relied upon to remove absolutely all disease-producing organisms. Therefore the water to be treated should be protected as thoroughly as practicable from pollution with sewage. If it is not practicable to abandon the intake at the Burt Street Station, measures should be taken to prevent dangerous pollution of the river between the Burt Street and the Florence intakes. Among the measures necessary to accomplish this would be the changing of the course of the Omaha and the Florence sewers so that their sewage would not empty into the river above the Burt Street intake.

(*b*) The protection of the Florence intake from pollution entering the river through Mill Creek. This could be accomplished either by moving the intake to a point above the mouth of the creek or by changing the course of the creek so that it would empty below the intake. If it is not feasible to secure protection of the water at the Florence intake against the contents of Mill Creek by changing the present relative positions of the creek's mouth and the intake, a considerable safeguard could be accomplished by proper disposal of the sewage on the watershed of the creek for 2 or 3 miles upstream, so that the contents of privies and cesspools would not empty or drain into the creek.

(*c*) The treatment of the water supply by some purification process or processes which will render it free from dangerous pollution. Judging from an inspection of the watershed on each side of the river from a distance of about 10 miles above Florence, and from reports as to amounts of sewage entering the river at points farther north, it appears probable that water taken from the Missouri River at any point between 201,000 feet north of (or upstream from) the present mouth of Mill Creek would average little if any higher in content of disease-producing organisms than would the water taken from the river at any points north of Omaha and south of Sioux City. Reliance should not be placed upon the self-purification of a river of the character of and being polluted as is the Missouri. This is particularly true in the time of thaws, when floating ice may carry for long distances organisms which, when so carried, are not exposed to the same conditions of sedimentation, etc., as when free in the flowing water. Therefore if the Missouri River is to be continued as the source of water supply for the city of Omaha, this water should be treated in such a way as to make it at all times wholesome and safe before it is delivered to the city.

In this connection the contemplated application to the water of the hypochlorite of lime treatment is to be commended as a step in the right direction, If it be found that the hypochlorite treatment will not effect an improvement to a point which may reasonably be considered one of safety, other processes of purification in the place of or in addition to the hypochlorite treatment should be applied. The efficiency of the hypochlorite method should be determined by a thorough bacteriologic study of the water before and after treatment.

The other processes recommended for consideration are (*a*) increased storage by installation of additional sedimentation reservoirs and (*b*) filtration.

What processes are best suited to meet the local conditions can be definitely determined only by experimentation. It is suggested that steps be taken as soon as possible to have such experiments conducted under the supervision of persons skilled in engineering and in the bacteriologic and chemical examination of water. On general principles and from such detailed study as has been made, a combination of the following processes for the improvement of the water supply of Omaha is recommended for particular consideration.

1. Protection, as thorough as may be practicable, of the watershed of the Missouri River against sewage pollution from sources—particularly near-by sources—upstream from the intakes.
2. Installation of additional storage reservoirs.
3. Use of adequate amount of coagulant.
4. Mechanical filtration.
5. Treatment of effluent from filters with hypochlorite of lime.

(*d*) Until some method or combination of methods of demonstrated efficiency for the purification of the water supply is in operation, the boiling by the people generally of all river water to be used for drinking purposes, or in any other way liable to result in swallowing organisms contained in the water. The boiling of the water for use in public schools and other public institutions is particularly advisable.

2. *Ice.*—The adoption of measures which will prevent so far as practicable the use of natural ice collected from the Missouri River or other polluted sources in drinking water or any foods or beverages subsequently to be consumed without cooking.

3. *Cesspools and privies.*—The immediate abolishment of all faulty cesspools and privies. All cesspools and privies should be abolished as rapidly as the extension of the sewerage system will permit. On premises not having sewer connections, cesspools which are not known to be water tight and which are not so maintained as to obviate any leakage of contents, with resulting pollution of surroundings, should be replaced with privies having water-tight tubs, pails, or boxes placed above ground for the reception of sewage. The privies should be screened so that flies will be prevented from having access to the contents. The tubs or boxes should be emptied before they become more than two-thirds full of sewage. The use of an efficient germicide, such as a solution of carbolic acid or chloride of lime, so as to keep the privy contents disinfected, is advisable at all times, and particularly in the summer time. The disposal of the privy contents through septic tanks connected with the sewerage system is suggested. All cesspools, whether to be maintained or abolished, should be disinfected as thoroughly as possible. This is particularly indicated for those which have received the dejecta from typhoid fever patients.

4. *The exercise of rigid precautions at the bedside to prevent the spread of infection from typhoid fever patients.*—As soon as a case is reported a representative of the health office should visit the residence of the patient and determine if possible how the infection was contracted and see that the proper precautions are being exercised to prevent the spread of infection. The employment of visiting nurses to aid in the enforcement of precautionary measures at homes of typhoid fever patients is strongly advised. Provision should be made for the free distribution of disinfectants to families unable to purchase them.

5. *The improving of general sanitary conditions and the exercise of as rigid sanitary supervision as possible over all places where foods or beverages are prepared for sale or offered for sale.*—These general sanitary measures are, of course, always advisable, but they are particularly so in Omaha at the present time, when the city has just passed through an extensive outbreak of typhoid fever and has in consequence an unusually large number of foci of infection in typhoid fever patients, and probably in typhoid bacillus carriers, and with the warm weather approaching, when the conditions are usually most favorable for the spread of prosodemic typhoid fever.

INVESTIGATIONS OF TYPHOID FEVER IN WILLIAMSON, W. VA.

On request of the State Board of Health of West Virginia, and in connection with investigations carried on in the Hygienic Laboratory, Passed Asst. Surg. W. H. Frost was sent to Williamson, W. Va., on May 27 to confer with the State board of health and to make an investigation to determine the methods necessary for the purification of the water supply of that city to prevent typhoid fever and other water-borne diseases. After a conference with the secretary of the board and the local health officer, Dr. Frost made a preliminary survey and undertook investigations bearing on, first, the general sanitary condition of Williamson; second, its water supply including bacteriological and chemical examinations designed to show the efficiency and available methods of purification; third, the prevalence of typhoid fever especially since November, 1909, its clinical type, its relation to the water supply, and other possible causes; and fourth, the prevalence of other diseases probably water borne.

In the summary of a report made June 29, 1910, Dr. Frost stated that Williamson had suffered since 1909 from a very extensive epidemic of typhoid fever, 150 cases having occurred among a population of 5,000. It is seen, therefore, that approximately 1 person out of every 33 in the town has had an attack of typhoid fever within a period of seven months. The death rate was 7.33 per cent.

From a careful study of the cases and the general sanitary condition, Dr. Frost was of the opinion that the recent epidemic originated in November, 1909, from the water supply, which is obtained from the Tug River, and which, owing to unusual conditions, was apparently badly contaminated. He concluded, however, that since November, 1909, the water had certainly not been the sole factor, nor probably the major factor in the causation of the disease. At least one-third of the cases occurring since November, 1909, may reasonably be attributed to contact with other cases and consequently due in great part to the lack of bedside prophylaxis. The interesting fact was developed that a choleraic diarrhea prevails to a very unusual extent. On account of its wide prevalence and its severity, this diarrhea is regarded locally as a matter of great economic importance.

As a result of his studies, Dr. Frost made recommendations of measures for the prevention of typhoid fever in Williamson, particularly that the water supply should be obtained from deep wells if practicable. If this should be found impracticable, it would become necessary to purify the water from the Tug River. For this purpose he recommended that the intake of the present water supply should be moved to a point above the town; filtration of the water preferably by means of a mechanical filter; treatment of the water after filtration with calcium hypochlorite, and that a plant for the chlorination of the water be immediately installed at the present pump house as an emergency measure.

Dr. Frost made specific recommendations as to the disposal of sewage, the care of typhoid fever patients, and the supervision of food supplies. The full report of the investigation has been published in Hygienic Laboratory Bulletin, No. 72.

Sanitary Inspection at Seabright, N. J.

A petition was received at the bureau from the mayor and citizens of the towns of Rumson and Seabright, N. J., which stated that the tug *Oriol* had sunk in the Shrewsbury River and was impeding the flow of sewage from one of the main sewers of Rumson, and that there was, by reason of this, danger of an outbreak of typhoid fever. As many persons come to these places during the summer season, there appeared to be danger of the spread of disease to other States.

An officer of the service was sent to investigate and report as to whether a nuisance existed and make recommendations toward abatement.

It was found that the sewer was not actually obstructed, but that the presence of the tug had caused a bank to form, and at low tide the sewage was exposed on this bank until it was removed by the next tide.

As there were no habitations in the immediate vicinity the conditions could hardly be considered as a menace to the public health, but as merely an undesirable and unsightly nuisance.

Inquiry showed that the State board of health of New Jersey had on two occasions ordered the sewer closed.

Inasmuch as the tug had been attached for debt and was not an obstruction to navigation, it could not be removed. It was therefore recommended that the order of the State board of health to close the sewer be enforced, or failing that, the outlet of the sewer be changed to a location where the existing disadvantages would not pertain.

Rabies and Antirabic Treatment.

Work on rabies has been continued in the Hygienic Laboratory, and in addition the question of the prevention and eradication of the disease was considered by a committee appointed at the seventh annual conference of State and Territorial health authorities. A brief abstract of the report of this committee appears on pages 67, 68, and the report has been published in the transactions of the eighth annual conference.

Persons exposed to possible infection have been given treatment at the Hygienic Laboratory. From April 29, 1908, when the first case appeared for treatment, until June 30, 1910, 192 persons have applied for and received treatment. During this fiscal year 59 have applied. A few discontinued the treatment before its completion. Letters of inquiry were sent out after completion of treatment and replies received in most cases. No deaths from rabies are known to have occurred, nor have any permanent ill effects followed the treatments.

From August 16, 1908, until June 30, 1910, 951 treatments have been furnished upon request of health officers and others for administration under their supervision. Up to that time antirabic virus had been supplied to State boards of health as follows:

Alabama, 326; California, 62; Colorado, 1; Delaware, 4; Iowa, 18; North Carolina, 285; North Dakota, 1; Rhode Island, 5; South Carolina, 122; Wisconsin, 84; total, 908.

The practice has been to send the treatments in the form of dried cords preserved in glycerin. By this means the virus can be transported long distances without appreciable loss of potency. The sections of cords are placed in small bottles of glycerin, properly sealed and labeled, and wrapped under aseptic conditions. Upon receipt of the cords by the State authorities it is only necessary to emulsify them before administration. This method has been found satisfactory.

Only two deaths from rabies were reported occurring during the course of the treatment. It is the purpose to assemble full data on the results of the use of the treatments, and the Director of the Hygienic Laboratory will, in the near future, undertake this work.

From reports received by the bureau it appeared that there might be some confusion with respect to the administration of antirabic virus at distant points. On account of the skepticism that still prevails among certain people regarding rabies, and because of the necessity of avoiding accidents that would discredit the use of antirabic virus as a prophylactic agent, the bureau was compelled to establish the invariable rule that this product shall be furnished only to State health authorities having laboratory facilities for its proper emulsification, and with the understanding that it will be administered under the direct supervision of such authorities. On March 29, 1910, a letter to this effect was addressed to the secretaries of all the State boards at whose request virus had been sent out from the Hygienic Laboratory.

The diagnosis of rabies in suspected animals has been made in only a few cases in which the material has been sent or brought to the Hygienic Laboratory. This work is regularly performed by the Bureau of Animal Industry, and is only done at the Hygienic Laboratory upon special request, or when it is desired to do so for the instruction of student officers. The positive diagnoses that have been made in the laboratory were based on demonstration of Negri bodies and inoculation tests—either one or both.

Research work has been carried on by Passed Asst. Surg. A. M. Stimson, and a general survey of the literature on rabies has been made and the material indexed. Experiments bearing on the practical points suggested in the course of routine work have been planned and carried out to some extent. Dr. Stimson has made a study upon the incidence of local reactions in the course of treatment, and the data collected were embodied in a paper by him. He has also made an extensive study of the general problem of rabies, and the results are embodied in Hygienic Laboratory Bulletin No. 65.

INVESTIGATION OF SMALLPOX AT BERKELEY SPRINGS, W. VA.

On request of the State board of health, Passed Asst. Surg. L. L. Lumsden was directed, on February 22, 1910, to proceed to Berkeley Springs, W. Va., an outbreak of smallpox having been reported from that locality. Upon his arrival Dr. Lumsden conferred with the local health officer and practicing physicians, who related that they had had in their practice for several months previous a number of cases of skin eruptions, some accompanied with fever. None of the cases had been strongly suspected of having smallpox until about February 15, when a case was reported to the local health officer as smallpox of fairly severe type. The health officer accepted the diagnosis and established a quarantine of the residence occupied by the patient, a prominent practicing lawyer of the town. Having verified the diagnosis of smallpox, the question arose as to whether the infection was contracted in Berkeley Springs or in some other locality.

The history of the case as given to Dr. Lumsden by the attending physician was, in effect, that the patient had had a chill on February 8, followed immediately by high fever and severe pains in the head and back. The fever ranged between 104° and 105°, and the pains continued until February 12, when large, hard, "shotty" papules were observed on the forehead, wrists, and a few on front of chest. With the appearance of the eruption there was marked amelioration of constitutional symptoms, and on February 13 the eruption was observed to be distributed quite generally over the body. These and other symptoms left no doubt as to the diagnosis, particularly as the patient had never been vaccinated.

An epidemiological study of the case revealed that the infection was in all probability contracted on January 26 at a house in Berkeley Springs in which there were at the time three cases of a disease diagnosed as chicken pox. A study of these three cases showed that one of them undoubtedly was smallpox, and the other two were in all probability cases of that disease, the infection having been brought from Oriental, N. C., on December 21. It was, accordingly, the opinion of Dr. Lumsden that the first case of infection was contracted in North Carolina, and that its importation to Berkeley Springs established a focus of infection which subsequently spread to a number of people. In order to prevent further spread of the disease, Dr. Lumsden advised vaccination as rapidly as possible of the entire population of the town, quarantine of dwellings in which cases were being cared for and disinfection of such dwellings upon the recovery of such cases, and surveillance by the health officer of contacts.

INQUIRY AS TO THE ORIGIN AND PREVALENCE OF LEPROSY IN CALUMET, MICH.

On September 24, 1909, the secretary of the State board of health of Michigan reported that information had come to his department of a case of leprosy in Calumet Township, and which was then under the observation of the physician in charge of the Calumet and Hecla Hospital, Calumet, Mich. Dr. Shumway also stated that there was no law in Michigan authorizing the care of lepers, and that the case was reported with the view that it might come under Federal jurisdiction. In reply, it was necessary to state that there was no provision in law for the care of lepers by the National Government, but that such persons if found to be aliens and in the country for a shorter period than three years could be deported.

The appearance of this case in Michigan, and the rumor that lepers had been leaving Norway for the United States, led the State board to request the detail of an officer of the service to determine the extent of leprosy, and the following resolution was adopted by the board October 8, 1909.

> That whereas, leprosy is present in the State of Michigan, and there is no provision for taking care of lepers or their indigent families; be it therefore
> *Resolved*, That the secretary of this board shall concur in any suggestions made by Surg. Gen. Wyman looking toward the establishment of a leprosarium for the care of lepers.

Leprosy being one of the quarantinable diseases within the meaning of the quarantine law of February 15, 1893, Passed Asst. Surg. T. B. McClintic was sent to Calumet and vicinity for the purpose of investigation.

Calumet is situated in the extreme northern part of Michigan, in the copper-mining district, and has a population of about 50,000. A large percentage are miners who have come from all portions of the globe, but principally from Norway, Sweden, Russia, Finland, Austria-Hungary, and Italy. Dr. McClintic, in company with Dr. Shumway, consulted with the physician of Calumet and Hecla Hospital, who, in January last, had reported the case of leprosy mentioned. The discovery had been made and the case reported as a result of an examination for a life insurance policy. The history of the case is as follows:

> Name, M. J.; born in Alten, Norway, 38 years ago; father, two sisters, and two brothers all living and apparently in good health; one brother was recently killed in a railroad accident. His mother died of leprosy in Norway on May 13 of this year after an illness of approximately four years. J. came to this

country from Norway on July 20, 1900, and settled in Calumet. Since his arrival in this country he has not returned to Norway, nor has he seen his mother. He worked in the copper mines in Calumet, and while so engaged during the spring of 1904 the first symptoms of the disease made their appearance.

It first appeared in his nose, for the relief of which he had an operation performed. His nasal passages had become occluded and the operation temporarily relieved this. During the summer of the same year (1904) he went to Alaska under contract with the United States Government to herd reindeer, and while there, during the following fall, the trouble with his nose returned, and the disease began to manifest itself on his face and hands.

He stated that his face and hands felt as though they had been slightly sunburned.

At the expiration of his one year's contract with the Government in Alaska he returned to Calumet and engaged in mining and carpentering. Since his return he has had exacerbations and remissions of the disease, until now he presents a typical picture of a well-advanced case of tubercular leprosy. His hands, face, and feet are one mass of tubercles. Scrapings from these tubercles and from the nasal mucous membrane obtained showed microscopically enormous numbers of lepra bacilli.

In his report, submitted June 17, 1910, Dr. McClintic stated that extensive inquiry among the local medical profession and laymen was made for the purpose of detecting other cases, but none could be found. The only history obtained of any other case in that vicinity was that of a Finlander, who was thought to have had leprosy about seven years previous, and who, on learning the nature of the disease and the possibility of being isolated, had disappeared. It is evident that in a town of 50,000 inhabitants, with as large a foreign element as has Calumet, incipient cases might exist without being detected, and this is shown by the fact that the case whose history is given above suffered with the disease for about five years before the diagnosis was made. In the family of this leper are five other persons. They were all closely examined by Dr. McClintic for symptoms of the disease, but none found. Scrapings of the nose by him were examined microscopically, all of which were negative.

In the absence of national or State provision for the care of this case it was necessary for the local authorities to make some arrangement. Isolated quarters and maintenance were furnished for the leper and his family by the general manager of a local mining company, and medical aid without compensation offered by the physician who had reported the case.

This case emphasizes again the necessity for some provision for the care and treatment of isolated cases of leprosy.

STUDIES ON MEXICAN TYPHUS FEVER, OR TABARDILLO.

Mexican typhus fever, or tabardillo, occurs from year to year in the City of Mexico and vicinity, and observers have called attention to the close clinical resemblance of the disease to Rocky Mountain spotted fever. Typhus fever being one of the quarantinable diseases mentioned in the regulations issued in accordance with the law of February 15, 1893, it became desirable and necessary to take up the study of this disease in Mexico in order to determine whether the two diseases are really identical. Passed Asst. Surgs. John F. Anderson and Joseph Goldberger, of the Hygienic Laboratory, were accordingly sent to Mexico City in November, 1909, to study the etiology and mode of transmission of the prevailing disease. Typhus fever, which is locally known as tabardillo, prevails to a marked extent in the City of Mexico and throughout the Mexican plateau at elevations above 1,800 meters. Until the past winter, nothing was known as to its etiology or mode of transmission.

These officers found from their studies that the disease was not identical with Rocky Mountain spotted fever, but a distinct disease, and was very probably identical with Old World typhus fever. Their preliminary report was published in the weekly Public Health Reports, December 10, 1909.

They found by further studies that the disease is not contagious in the ordinary sense of the word, but that it is conveyed by the body louse. These studies were made upon monkeys. They succeeded in producing the disease in two species of monkeys—*Macacus rhesus* and *Cebus capucinus*—by the inoculation of blood from human cases of typhus fever. They found that the virus would not pass through a Berkefeld filter. The later results were published in the Public Health Reports of December 24, 1909, and February 18, 1910, and in the Journal of Medical Research June, 1910.

Drs. Anderson and Goldberger state that in measures for the control and eradication of the disease there should be taken into consideration the body louse as the intermediary concerned in the transmission of the disease.

During the course of the investigations Dr. Goldberger developed typhus fever and after a severe illness lasting two weeks fully recovered. On account of his illness the work was interrupted, and both of the officers were compelled to return to Washington.

Studies of Tuberculosis.

The bureau is in receipt from time to time of requests for information regarding climate as an adjunct in the treatment of tuberculosis, with particular reference to the suitability of the different climates in the United States for those suffering with that disease. Tuberculous patients are sometimes puzzled by conflicting advice on the subject of climate, and it is not surprising that diverse opinions prevail. Confusion of ideas on the subject has been increased by the search for regions reported to be free from tuberculosis, the inference being that such places offer favorable climatic conditions.

While it is recognized that tuberculosis may be successfully treated in practically any part of the country, and that change of climate may in some instances be injurious to those afflicted, it was thought desirable to further investigate the subject and present a fair discussion for distribution and for the guidance of those interested.

In connection with other studies of tuberculosis at the marine hospital sanatorium at Fort Stanton, N. Mex., Passed Asst. Surg. F. C. Smith was therefore directed to inquire into the subject of climate in relation to treatment and prepare an article for publication. This was done, and a public-health bulletin has been issued, entitled "The Relation of Climate to the Treatment of Pulmonary Tuberculosis." In this publication, Dr. Smith, from a review of the literature, presents expressions of tuberculosis experts regarding climate as a therapeutic measure. He mentions adequate and intelligent rest, proper and sufficient food, and an abundance of pure air as the most important factors in promoting recovery from pulmonary tuberculosis, and points out that change of climate has for its object the improvement of these conditions. At the same time, he emphasizes the fact that change of climate in any particular case must be decided on its merits, and that changes without such consideration are inadvisable. In order to make this decision, Dr. Smith urges preliminary observation and study of cases before advising change of climate, and states that far advanced cases should not be sent to distant points. He presents a list showing the locations of the various State sanatoria, and discusses the advantages and disadvantages of the special climates popularly resorted to by tuberculous patients.

A public health bulletin entitled "Tuberculosis, Its Nature and Treatment," has also been prepared by Passed Asst. Surg. Smith. The need of such a publication is shown by the frequent requests for information on the subject. In this publication Dr. Smith has plainly described the cause of the disease, its methods of transmission, the symptoms and the precautions to be taken to prevent its communication to others. There is also included advice to those afflicted, and a copy of the regulations to prevent the spread of tuberculosis in Government buildings, offices, and workshops issued under authority of Executive order of December 7, 1905.

During the year the same officer made an analysis of 56 deaths from pulmonary hemorrhage at the United States Marine Hospital Sanatorium, Fort Stanton, N. Mex. These fatalities from pulmonary hemorrhage cover a period from the opening of the sanatorium in 1899 to 1909, and represent a little more than 10 per cent of the total mortality from that disease. The cases are tabulated by Dr. Smith according to age, being divided into 10-year periods. They were also studied in relation to race and history of alcoholism and syphilis. According to the records studied there were admitted during the period under discussion 1,754 patients, with a total of 527 deaths.

PELLAGRA.

In the last annual report attention was invited to the subject of pellagra and the importance which this disease, new to American medicine, had begun to assume as a public-health problem in the United States. The subject was briefly reviewed, and the attention which it had received at the hands of the service was commented upon. Announcement was also made that a commission had been appointed, with the approval of the Secretary, for the further investigation of the disease.

During the past year the service has attempted to devote the attention to this disease which its apparent importance at present seems to warrant. Passed Asst. Surg. C. H. Lavinder has devoted much time to its study, and facilities have been given him for pursuing his investigations. Having completed the preliminary studies at Columbia, S. C., in September, 1909, he closed his laboratory there and returned to Washington, preliminary to being sent abroad early in the spring for further studies on the disease in Italy.

After his return to Washington he was occupied with the completion of the studies begun at Columbia and collating his results. Some of these have been published in two papers—one on prognosis and treatment, appearing in the Public Health Reports; and another embodying certain studies on the blood, read at the conference on pellagra in Columbia, S. C., and appearing subsequently in the proceedings of that body. Dr. Lavinder's work has also included attendance at scientific meetings, inspections of cases at hospitals, and preparation of memoranda for use in an educational way.

In November, 1909, the Surgeon General called the first meeting of the pellagra commission, but its labors have been interrupted by other official duties, although individual members have done considerable work.

Passed Asst. Surg. J. D. Long was detailed to see cases of pellagra at Philadelphia, Pa., and Columbus, Ga., at the request of the respective health authorities, and he spent some time in the study of the disease at Columbia, S. C. These studies included a determination of the incidence of amebiasis in pellagra and X-ray studies of the osseous system in such cases.

Pathological studies on material collected have been made and are being continued, the reports of which, however, are not yet ready for publication. Dr. Nicolas Achuccaro, a member of the commission, in a communication to its secretary, stated as follows:

> I examined by Nissl's method three cords sent me and a small piece of cerebral cortex from one case. My time was limited and material not very abundant for conclusions, but results were nevertheless of interest in so far as the nature of lesions in ganglionic cells is concerned.
>
> In many cells the cellular changes called axonal reaction were found; central chromatolysis and lateralization of nucleus with some swelling of entire cellular structure. Proliferation of the neuraglia was present, but in none of the cases marked signs of inflammatory pervascular infiltrations could be detected. The picture was one seen in intoxications of different characters. Nothing pathognomic. In the meninges of the piece of brain examined there were very slight signs of an infiltration inflammatory in character.

On March 14, 1910, Passed Asst. Surg. Lavinder was sent to Milan and other places in Italy to make comparable studies of pellagra. In his reports he states that the disease in that country and the United States are identical, but that there is an absence in Italy of the acute cases seen in the United States. His studies abroad have taken cognizance also of the various theories as to etiology, and the information gathered will be used in subsequent investigations at home.

The service was represented at a national conference on pellagra, held under the auspices of the State board of health of South Carolina, November 3 to 4, 1909. The meeting, which was the first of its kind in America, was held at Columbia, S. C., and there were present over 350 physicians. The attendance at the meeting showed the interest that has been aroused in the disease and indicated in some measure its public health importance in the United States.

The proceedings of this meeting, an account of which was published in the weekly Public Health Reports of November 12, 1909, were of much importance and showed the keen interest with which the disease is being watched. A large number of papers were presented, two of them by officers of the service, and there was organized a permanent association to be known as the National Pellagra Conference of the United States; its next meeting to be held in Peoria, Ill., at a future date.

AMEBIASIS.

As a result of investigations made by the service and from a review of medical literature it appears that amebiasis (tropical dysentery) is a much more common disease than is ordinarily thought, previous reference to this fact having been made in the annual report for 1909.

Cases have been found in 25 States. In the District of Columbia, amebæ have been cultivated in various localities from vegetables and from water used for drinking purposes.

It is thought that the disease is spread through the use of vegetables (which are eaten uncooked) that have been infected by the use of human excrement as a fertilizer.

Investigation has shown the presence of amebæ in wells used for drinking purposes, and it is possible that cases are infected through the use of this water and through milk that has been transported in cans rinsed with infected water.

INVESTIGATIONS OF ACUTE ANTERIOR POLIOMYELITIS (INFANTILE PARALYSIS).

On July 22, 1910, the secretary of the State board of health of Iowa invited attention to a serious outbreak of anterior poliomyelitis in Mason City, Iowa, and requested the cooperation of the service in an investigation to determine the origin and prevalence of the disease. Passed Asst. Surg. W. H. Frost was accordingly sent to Des Moines, Iowa, to confer with the State board, and then to Mason City, Britt, and Grundy Center, Iowa, to make investigations of the outbreak.

A careful study has been made of localized epidemics in the three latter-named places with special reference to the origin and means of dissemination. At the same time, the State board of health was collecting from physicians throughout the State uniform reports regarding the occurrence of anterior poliomyelitis, which should furnish a compilation of valuable statistics on the disease.

Some experimental work has been going on in the Hygienic Laboratory, and the bureau has undertaken the compilation of statistics to ascertain the prevalence of infantile paralysis in various sections of the country.

The epidemic occurrence of anterior poliomyelitis has been noted by observers in many parts of the world for the last 30 years.

Lovett,[1] of the Massachusetts State board of health, gives the following summary of outbreaks from 1880 to 1909:

	Outbreaks.	Cases.	Average number of cases.
1880–1884	2	23	11.5
1885–1889	7	93	13
1890–1894	4	151	38
1895–1899	23	345	15
1900–1904	9	349	39
1905–1909	25	8,054	322

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[1] Lovett, Robert W.: The occurrence of infantile paralysis in Massachusetts in 1909 (reported for the Massachusetts State Board of Health). Boston Med. & Surg. Journ., vol. 163, no. 21, 1910.

Especially during the last semidecade there has been a great and widespread increase in the number and size of epidemics of this disease, constituting a pandemic which, roughly speaking, has spread from Norway and Sweden in 1903–1905 to Germany, Austria, Holland, and the United States. The first epidemic reported from a large city occurred in New York City and vicinity in the summer and fall of 1907. Spreading apparently from this focus the disease became prevalent in small epidemics in the New England States, where it has been increasingly prevalent since that time. More recently, especially in 1908 and 1909, extensive outbreaks have been reported in Minnesota (about 150 cases in 1908, 500 to 600 cases in 1909), Nebraska (619 cases in 1909), Kansas (over 100 cases in 1910), and Missouri.

The prevalence in 1910 promised to be even greater than in 1909. In Minnesota during the first half of 1910 there were approximately six times as many deaths from poliomyelitis as in the corresponding period of 1909.[1] Kansas has reported 47 cases in 1910 up to July 23, a considerable increase over the number reported last year. Thirty deaths from anterior poliomyelitis and over 160 cases, distributed among 45 counties, have been reported to the State board of health of Iowa up to August 25, indicating a very marked increase in prevalence there.

Small outbreaks and sporadic cases have not generally been reported. The above figures are not therefore indicative of the real prevalence of the disease. It is highly probable that the increase of distinct outbreaks in so many States has been accompanied by an increase in the number of sporadic cases occurring in other States where no special attention has been paid to the disease. This has apparently been the case in Iowa for several years.

Epidemics of anterior poliomyelitis have been most frequent and extensive in northern latitudes in the summer and fall months. The seasonal and geographic distribution is not, however, strictly limited. An epidemic of 140 cases has been reported from Cuba; and cases have occurred at all seasons of the year in all parts of the United States. More than half of the total epidemic cases reported within the last five years have occurred in the northern part of the United States, east of the Dakotas.

The mortality rate has varied from 5 per cent (New York epidemic of 1907) to about 20 per cent (Minnesota, 1909), and even 29 per cent (Kansas, 1909).[2]

The seriousness of the disease is, however, out of all proportion to its fatality, since it is estimated that 75 per cent of all those who recover are more or less crippled for life. In addition to causing lifelong suffering, the disease entails a great economic loss, as many of its victims, being incapacitated from earning a living, must become public charges. The treatment of such cases is difficult and prolonged, adding greatly to the expense of maintaining public hospitals. Within the last year great progress has been made in the knowledge of the etiology of poliomyelitis, with corresponding increase of confidence in the efficacy of preventive measures. It has been proven by work at various laboratories, notably the Rockefeller Institute for Medical Research, that anterior poliomyelitis is transmissible to monkeys; that the causative organism is a "filterable virus;" that not only the central nervous system, but also the secretions of the nose and mouth, are infective, and that the most probable avenues of infection are the respiratory and digestive tracts. A distinct immunity has been demonstrated in recovered persons and animals, holding out the hope, as yet far from realization, of a possible specific therapy.

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[1] Editorial: Journ. Minn. State Med. Assn. and Northwestern Lancet, n. s., vol. 30, No. 16, 1910.

[2] Note: The percentage of mortality would be lower than this if abortive cases had been included.

Studies of the pathological anatomy had already pointed to the conclusion, which has since been confirmed experimentally, that anterior poliomyelitis is a general infection, with specific tendency to localized lesions of the central nervous system. The significance of the morbid anatomy, however, had not received sufficient general recognition.

Careful clinical and epidemiological studies of outbreaks have added knowledge no less important than that derived from laboratory investigations. The classical monograph by Wickman, embracing a study of about 1,000 cases in numerous outbreaks, added very greatly to the knowledge of the diverse clinical types of the disease. Unfortunately, there is no English translation of this work and a first-hand knowledge of it is still limited to a very few among the medical profession. Studies of various outbreaks have been published from time to time in the United States, but only very recently have these been on a sufficiently broad basis to attain widespread circulation.

The New York epidemic of 1907 was most carefully studied by a collective investigation committee, composed of representatives from the New York Neurological Society, the Pediatric Section of the New York Academy of Medicine, the Rockefeller Institute for Medical Research, and the department of health of the city of New York. Their report, issued this year, contains, in addition to statistics from a large number of cases, valuable reports on recent experimental work, and pathological and clinical studies.

The Massachusetts State Board of Health began in 1907 a study of anterior poliomyelitis in the State by sending out record blanks to be filled in. In 1908 a personal study of about one-half the cases in the State was made, and in 1909 a much more extended study was undertaken by special investigators under the direction of the State board and with the assistance of an advisory board, consisting of Prof. Theobald Smith, Prof. M. J. Rosenau, and Prof. J. H. Wright, of the Harvard Medical School. The intensive study of 150 cases made in this manner resulted in perhaps the most careful collection of statistics available for this country. The work is being continued in 1910 with promise of even better results.

The Minnesota State board of health turned their serious attention to a study of anterior poliomyelitis in 1909, placing an experienced epidemiologist in the field and offering the resources of the State laboratories for research work. No full report of this investigation has been made, but a number of valuable contributions have resulted.

The Kansas State board of health has collected and published some statistics dealing with the cases occurring in that State in 1909, together with a precis on symptomatology and pathology.[1]

The combined result of all the studies being made must necessarily make a considerable contribution to our knowledge of this disease. Such knowledge is badly needed, as anterior poliomyelitis is a disease of very various types and manifestations, whose epidemic occurrence is influenced by factors at present almost wholly unknown. The diligent pursuit of further studies, both in laboratories and in the field, is necessary to give a broad basis for conclusions as to all the factors concerned in the spread of anterior poliomyelitis.

It is necessary that such studies should be not only extensive, embracing the largest possible number of cases, but that they should be carried on by the personal investigation of trained observers, since the records of the observations of a few men of wide experience will prove more valuable than equally extensive records compiled from the observations of many different observers.

There is urgent need at present of a comprehensive literature, readily available, for the whole medical profession. The studies above referred to, the publications of various State boards of health, and the contributions of many independent observers are rapidly accumulating the material for such a literature, which remains, however, to be put together in more condensed and universally available form.

PREVENTIVE MEASURES INDICATED.

The importance of anterior poliomyelitis from a public-health standpoint rests not only upon its seriousness, but upon its preventability. That it is preventable is now generally recognized in the light of the experimental proof of its infectious nature. So long as any of the factors in the causation of epidemics remain unknown preventive measures must necessarily be correspondingly inefficient or unduly burdensome. Enough is already known, however, to indicate the necessity of the following preventive measures:

1. Rigid quarantine of all cases and contacts; disinfection of all secretions, excretions, and fomites; fumigation of premises after recovery.[2] There is reason at least to suspect that persons are infective in the preparalytic stage, and that abortive cases which can not as yet be clinically recognized with certainty are an important factor in the spread of epidemics. Quarantine, to be effective, must therefore include suspected cases.

2. Susceptibility and infection seems to be not universal. Whether susceptibility, when it exists, is congenital or acquired is not known. In the absence of such knowledge it is well for local authorities to advise such hygienic precautions as shall prevent conditions generally supposed to predispose to infections, such as overheating, chilling, gastro-enteric, and respiratory troubles.

3. It has been strongly suggested that dust is an important factor in the spread of infection. So long as this suspicion remains it is

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[1] Bulletin of the Kans. State Board of Health, vol. 6, No. 7, July, 1910.

[2] It has been demonstrated that standard formaldehyde fumigation will kill the virus. Until insect transmission can be definitely settled, the advisability of using sulphur must be considered.

certainly advisable to abate the dust in epidemic foci by thorough sprinkling.

4. The occasional occurrence of paralysis among domestic animals in the vicinity of epidemics of anterior poliomyelitis has suggested that the infection may be disseminated by animals. Although the demonstrated insusceptibility of domestic animals to the virus of anterior poliomyelitis diminished the probability of this means of transmission, it is important that more attention be paid to paralytic diseases of animals; that the profession generally be apprised of this suspicion in order that their cooperation may be obtained in studying the paralysis of animals.

Resolutions, recognizing the infectious and transmissible nature of anterior poliomyelitis and recommending the adoption of preventive measures, were adopted by the American Orthopedic Association and the American Pediatric Society at the last congress of American physicians and surgeons in Washington, May, 1910. Measures making anterior poliomyelitis a reportable disease and either enforcing or strongly recommending preventive measures have been adopted in Massachusetts, Minnesota, Kansas, Nebraska, Iowa (and possibly other States).

Studies of Cancer.

Studies on cancer have been made in the Hygienic Laboratory and the Federal plague laboratory during the year, especially in relation to diagnosis and occurrence of the disease in the lower animals. These studies have rendered possible more accurate diagnoses of the various forms of malignant growths found among beneficiaries of the service. The studies of mouse cancer have included transplantation experiments as bearing on the phenomenon of anaphylaxis and the broad subject of immunity, and the studies of animal parasites of man have been pursued with the knowledge that some parasites are irritants and produce conditions recognized as precancerous.

The study of cancer is of no recent date, but until eight years ago, such studies were mostly of a clinical, statistical, and pathological nature. Nevertheless a large amount of work was done on the problem in different parts of the world, and some definite knowledge was gained and taken advantage of by surgeons in the treatment of this disease. Some of the data accumulated were also to become of value in showing the complexity of the problem and its relation to the public health.

It is the growing impression that cancer among human beings is on the increase, and this view is supported by the increasing number of deaths recorded as due to the disease in practically all countries. On the other hand, there are those who account for this apparent increase on the grounds of improved diagnosis, lack of proper interpretation of statistics, and the greater expectation of life brought about through decreased mortality from infectious diseases. The director of the imperial cancer research fund, London, has stated "there is no doubt that an absolute increase of the number of cases of cancer recorded from year to year is taking place not only in practically all races of mankind, but also in vertebrate animals. Nevertheless, to alarm the public by proclaiming this as 'an increase of cancer' in the sense that there is an increase disproportionate to the numbers and age constitution of the populations examined, is pure sophistry."

That a further increase of the recorded cases of cancer may be expected is shown by the fact that in Berlin 20 per cent of those dead from cancer come to autopsy without a diagnosis having been made.

A consideration of the evidence leads one to the conclusion that the alleged increase of cancer is more apparent than real; that the increase has not been in frequency of occurrence, but in the knowledge of the actual frequency of its occurrence. In other words, absolute increase of cancer has not been proven, and the question remains open for the present. Age incidence being an essential factor, statistical studies to be of value must be based on the proportion that those over 35 years bear to total population. So far as known such studies have not been made and the statistical data for such study are not available.

The cause of cancer is not yet known. It is reasonably certain, however, that it is not due to a specific parasite, other than the cancer cell itself which takes on lawless growth under certain conditions. All of these conditions are not known, but it is known that certain irritants predispose to cancer, and among them may be mentioned animal parasites. The biological and other studies made in the Hygienic Laboratory and elsewhere may, therefore, in the future have an important bearing on new irritants that predispose to cancerous growth.

Success in transplantation of tumors in lower animals has opened up a new field for investigation. The discovery that cancer is transplantable from one individual to another of the same species has given an impetus to the numerous experimental attempts to transplant tumor growths and living tissues that have been made during the past eight years. At the present time cancer research is being undertaken in no less than 18 scientific institutions and research laboratories in the United States and abroad. The most conspicuous of these are the Rockefeller Institute, Cornell University, and Columbia University, New York; New York State Cancer Laboratory, Buffalo, N. Y.; Harvard University, Boston; University of Pennsylvania, Philadelphia, Pa.; St. Louis Skin and Cancer Hospital, St. Louis, Mo.; Laboratory of Pathology of the Chicago Polyclinic; Strecker Memorial Laboratory of the City Hospital, New York; and abroad: McGill University, Montreal, Canada; Imperial Cancer Research Fund, London; University of Manchester, England; Imperial Board of Health, Berlin, Germany; Ehrlich's Laboratory, Frankfort, Germany; Pasteur Institute, Paris, France; Veterinary and Agricultural School, Copenhagen, Denmark.

As stated above, new impetus has been given to the work within the past eight years, and much of the research has been experimental, starting with the discovery that cancer is transplantable from individual to individual of the same species.

Since mice are subject to various forms of cancer akin to those occurring in man, and further because of the short life of this animal, it has been the favorite one for experimental purposes.

It has been known also for some years that fish suffer from cancer, and that in them the disease most commonly takes the form of thyroid cancer. This has been described by several workers, though no experimental work at transmission has been done. It therefore presents in this respect a new field that should be explored. Mice, however, are higher in the animal scale than fishes and offer a much better field for research, and the observations made can with less reserve be compared with the disease in man.

On account of other important investigations under way in the Hygienic Laboratory, and because of the amount of attention given the cancer problem elsewhere, it has not been made the subject of continuous study in the Hygienic Laboratory and the Federal plague laboratory, though both afford opportunities for such research.

The results of studies thus far made, indicate that the solution of the cancer problem is to be found by intensive biologic studies of cell life. The conviction is growing that the cancer cell differs from the normal healthy cell chiefly in its power to multiply indefinitely, and when the factors bringing about this lawless growth are determined the problem of the etiology and propagation of cancer will have been solved.

With its Divisions of Pathology, Zoology, and Chemistry as organized, the Hygienic Laboratory is prepared to undertake comprehensive biological studies, provided the necessary funds are made available. But the studies should be made on broad lines and to include various phases of biological research. The possibility of the establishment of immunity to cancer in the lower animals has been shown, and it is not too much to expect that a similar achievement may be attained in the case of man. In fact, preliminary reports of success have already been made in this field by certain investigators, and studies of this character might well be carried on in connection with that of viruses, serums, and toxins.

STUDIES OF DISINFECTANTS.

Early in the latter half of the fiscal year the director of the Hygienic Laboratory and Passed Asst. Surg. T. B. McClintic began work upon a method for the standardization of disinfectants. This is a problem of great difficulty, but it is believed that a satisfactory and practicable method has been worked out, the details of which only remain to be elaborated. As soon as this has been done, it is contemplated beginning the examination of practically all the commercial disinfectants found in the market and the publication of the results as a Hygienic Laboratory bulletin, in order that the public and health officers may have an exact knowledge of the real value of many so-called disinfectants.

In addition to this work, a large number of samples of disinfectants have been examined at the request of the chief clerk of the Treasury Department and report made upon the same.

Until relieved from duty at the Hygienic Laboratory, Passed Asst. Surg. Carroll Fox was engaged in a study of the use of hyperchlorite of lime for the purification of water and sewage. This substance is coming into quite general use for the purification of drinking water on account of its cheapness and efficiency. Where waters are not very highly polluted, the results so far reported seem to indicate that the method is a satisfactory substitute for filtration. The work embraces a study of its action in the purification of water, the influence of suspended matter, various degrees of hardness, and a greater or lesser admixture of organic matter.

Dr. Fox also studied the efficiency of tincture of iodine as a disinfectant. This substance has recently been suggested as a valuable means for the disinfection of wounds where there is much destruction of the tissue. It has also been suggested for use in preparing the field of operation in emergency abdominal operations.

In connection with antiplague measures in California, studies have also been made in the Federal plague laboratory of some of the common germicides and insecticides, particularly with reference to the destruction of fleas. The results have been printed in the Public Health Report of July 29, 1910, under the title "Notes on Agents Used for Flea Destruction." In the summary of this report, based on investigations made, it states that water is of little value in the destruction of fleas; that glycerine is practically inert as a pulicide; that alcohol in the strength of 70° and absolute is uncertain in its action and practically inefficient; that kerosene and miscible oil are extremely efficient as flea destroyers; that formalin, phenol, mercuric chloride, and trikresol in the strengths used as disinfectants are of little value in killing fleas; that powdered sulphur proved of no value; and that the fumigants, bisulfide of carbon, hydrocyanic acid gas, and sulphur dioxide, are highly efficient in the strengths employed for flea destruction.

Investigations of Embalming Fluids.

The National Funeral Directors' Association in 1907 passed the following resolution:

> *Resolved,* That the United States Public Health and Marine-Hospital Service be requested if practicable to undertake a scientific investigation into the methods of preparing bodies dead of communicable diseases, particularly with reference to the disinfecting substances.

This investigation of disinfectants used as embalming fluids was undertaken in the latter part of 1909 by the director and assistant director of the Hygienic Laboratory, the stress of work then in process not permitting this study up to this time. The investigations have been carried along mostly by the assistant director, with the assistance of the Division of Chemistry, and have consisted of:

1. A chemical examination of the commercial disinfectants to determine the amount of formaldehyde present and the presence or absence of certain mineral poisons, particularly arsenic and antimony.
2. The action of these commercial embalming fluids for the destruction of infection in animals dead of certain infectious diseases.
3. The preservative action of these commercial fluids, or their power to prevent putrefaction of bodies embalmed with them.
4. The amount of formalin solution that will prevent putrefaction in dead bodies.
5. The minimum amount of formaldehyde solution that will destroy infection when used for embalming animals dead of certain infectious diseases.

This work was completed in time for presentation before the National Funeral Directors' Association at the annual meeting in Detroit. This is a matter that has an important public-health bearing in that as a result of it regulations may be framed in regard to the transportation of bodies of persons dead of infectious diseases.

Experiments with Privies and Night Soil.

The fact can not be too frequently emphasized that for localities and homes not provided with a sewer system the privy with its night soil is one of the most important factors to be considered in connection with the conservation of health. A poorly kept outhouse is a menace not only to the health of the family using the same, but also to the neighbors. It forms one of the common breeding places for flies and one of the distributing points for typhoid fever, hookworm disease, amebic dysentery, and other intestinal infections.

The service, through the Hygienic Laboratory, has prepared several articles on the subject of sanitary privies and has instituted a series of experiments in respect to the best method of safeguarding against contamination from fecal material. It is too early in the experiments to justify final recommendations, but the opinion is firmly established that there is an urgent necessity for remodeling the surface privies into outhouses provided with a pail, bucket, or barrel.

It is an open question as to just what material it is best to use in this receptacle. Investigations indicate very strongly that the use of dry lime or dirt does not give the protection generally attributed to these substances. The great difficulty with any "dry" system is that it depends upon the cooperation of all persons, children and negroes included, who use the privy, and experience shows that this cooperation can not be relied upon. The custom of using crude carbolic acid in various proportions in the receptacle is by no means a new one, for it has been in use in various localities for many years. The general distribution of such a poison as carbolic acid gives rise to serious misgivings which justify a note of warning. The use of kerosene and water to prevent the breeding of mosquitoes is well known, and the professor of zoology, of the Hygienic Laboratory, has suggested a trial of this same substance in the privies, using a small amount of water in the receptacle and a film of kerosene oil poured on the water. Experiments thus far show that this simple method results in preventing the breeding of flies in the privy, but its effects upon pathogenic organisms remains to be thoroughly tested. For the present it may be conservatively stated that the addition of lime, dirt, wood ashes, or water and kerosene to the tub system is a great improvement over the tub system without any safeguarding material.

THE USE OF NIGHT SOIL AS FERTILIZER.

The use of night soil as fertilizer is more widely spread than is popularly supposed, and indications are not lacking that this pernicious custom is a source of disease infection which demands prompt and serious attention. Investigations along this line will be continued this year.

HEALTH PROBLEMS ON FARMS.

Although various organizations in this country have interested themselves in the condition of women and children in the cities, and especially in industrial life, relatively little attention has been paid to similar problems on the farms. This service has on various occasions published reports calling attention to the undue amount of sickness on the farms caused by poor sanitary conditions. The subject aroused wide-spread additional attention through the work of the Country Life Commission appointed by ex-President Roosevelt.

The Division of Zoology of the Hygienic Laboratory has continued studies along this line. There are, at present, records covering 4,645 farmhouses located in six different States. Incredible as it may seem, 55.2 per cent of these homes are surrounded by a condition of theoretically maximum soil pollution because of the absence of a privy. Of the farmhouses tabulated as occupied by whites, 35.4 per cent have no privy, and of those occupied by negroes, 76 per cent were without any toilet. Under conditions such as these it is natural that we have in our rural districts an unnecessary amount of soil pollution with resulting sickness and death. Even when a privy is present it is the exception rather than the rule to find one of the sanitary type.

A popular campaign of education looking to an improvement in the sanitary conditions of our farms is an absolute necessity.

In the educational efforts that have been made for the negro, comparatively little attention has been paid to interesting him in cleanliness. The insanitary conditions under which the negroes are living, not only on the farms, but also in the cities and towns, constitute a serious menace to the health of communities. As the vast majority are tenants of white landlords, it is clear that the latter must be urged or compelled to improve the sanitary surroundings of the negro, not only as an act of humanity but also as a protection to the health and life of the whites.

RELATIONS TO THE PHARMACOPŒIA.

Work has been actively continued in the Division of Pharmacology of the Hygienic Laboratory on the Digest of Comments on the United States Pharmacopœia. The second volume, a work of 523 pages, covering the literature of the year 1906, has appeared, and the page proof of the third volume, covering the year 1907 (a work of about equal size), has been received from the printer. The volumes for 1906 and 1907 contain also a digest of the comments on the National Formulary, prepared, with the approval of the Secretary of the Treasury, in response to a resolution of the American Pharmaceutical Association asking the Surgeon General to undertake this work. Since the National Formulary as well as the United States Pharmacopœia is recognized by law as a legal standard in interstate commerce the desirability of including comments on this work is evident. Both are now being revised.

These digests have continued to receive the warmest approval of those interested in the enforcement of pure drug laws and of those engaged in this and also in foreign countries in preparing national pharmacopœias. The Pharmaceutical Journal (London, Apr. 23, 1910, p. 510), reviewing Bulletin 58, says:

> As an example of thoroughness in the department to which it specially applies it is probably unequaled anywhere. * * * The compilers having hit upon what is undoubtedly the right way to go about it, have apparently left no leaf unturned in their efforts to find material which in any way dealt critically with official articles.

The ninth decennial convention for the revision of the United States Pharmacopœia passed a special vote of thanks to the service for this work.

A number of laboratory investigations relating directly and others indirectly to the Pharmacopœia have been undertaken in the Division of Pharmacology. The solubility investigations of pharmacopœial compounds have been continued during the year and satisfactory results obtained upon all the remaining organic acids and their salts which are included in the Pharmacopœia. Upon the completion of this group, which comprises about 40 compounds, a comprehensive bulletin was prepared and printed as Bulletin No. 67 of the Hygienic Laboratory. These solubility results, in addition to being of much value in correcting the pharmacopœial data on this subject, are of considerable scientific interest in that they may throw light upon the relations between chemical structure and solubility—a subject which, although of the greatest importance, has so far resisted practically all attempts toward solution.

The immediate importance of this subject to pharmacology and therapeutics is the general connection between chemical constitution and physical properties, which is the stepping-stone to the ultimate solution of the problem of the relation of chemical structure to therapeutic action.

At the request of the committee of revision of the United States Pharmacopœia and with their aid, the study of the physical constants of pharmacopœial compounds has been extended to include melting points. The determination of the melting point is perhaps the most important individual and most commonly used test for determining the purity of most organic pharmaceutical substances. Because of the great variety of methods and procedures commonly applied in determinations of this constant, however, the test does not readily yield to attempted standardization. It is of much importance that the various tests prescribed by the Pharmacopœia for the standardization of drugs shall be so reliable and refined as to yield reasonably concordant results at the hands of different independent investigators.

The study of melting points was undertaken with the two-fold purpose:

(1) To select or devise a simple, reliable method (or methods) for melting-point determinations which could be recommended to the committee of revision for official adoption as the standard of the United States Pharmacopœia; and (2) the standardization of the melting points of pharmacopœial compounds by application of the method selected. The investigation has been found to be of very considerable proportion, and is by no means completed. An intelligent conception of the problem in its various phases involved the compilation and careful study of melting-point data, as obtained from various pharmacopœias, and also the careful review of an

abundant literature. The work so far completed includes the selection of one method, and the standardization of a considerable number of the more important organic compounds, involving many melting-point determinations upon each of five to eight different samples of every compound—each sample being subsequently standardized by application of all other United States Pharmacopœia tests. Two papers upon this subject were prepared for different pharmaceutical meetings and subsequently published. A bulletin incorporating the results of this work, and a thorough discussion of the melting-point problem, has been published.

The examination of samples of drugs purchased by the purveying depot for use in the marine hospitals has afforded additional opportunities of testing the accuracy and practicability of many of the analytical and other methods of the United States Pharmacopœia and has suggested several lines of work. The results of some of these investigations are included in the following publications: Pharmacopœial Tests for Ammonium Benzoate, Distribution of Alkaloids Between Immiscible Solvents, and the Purity Rubric and the United States Pharmacopœia. Several other subjects under investigation in the Division of Pharmacology, and which are mentioned under that division, have important bearings upon the pharmacopœia—e. g., the work on digitalis, epinephrin, and the thyroid.

At the Ninth Decennial United States Pharmacopœia Convention, which met in Washington in May, 1910, the service was represented by three official delegates, and seven other members of the service were delegates from other institutions. One member of the service was elected secretary of the convention and three others members of the committee of revision.

The director of the Hygienic Laboratory was selected as chairman of the subcommittee on biological products and diagnostic reagents.

The convention in its principles of revision recommended that those biological products for which a standard had been established by the Government should be admitted to the pharmacopœia. This will result, in all probability, in the admission of tetanus antitoxin and vaccine virus and possibly tuberculin. It is especially gratifying that the chairmanship of this subcommittee came to the laboratory, as it is recognized that such products, before their admission to the pharmacopœia, should be passed upon by the laboratory.

Inspection of Buildings Occupied by the Department of the Interior.

On November 1 the Secretary of the Interior requested that the Patent Office, Pension Office, and the old Post Office Buildings be inspected with a view to suggesting improvements in the sanitary conditions. Two officers of the service, with the assistance of Mr. F. W. Pease, inspector of repairs, were promptly detailed for this work. After a thorough investigation, a separate report on each of the buildings was rendered by these officers in which were pointed out the existing defects and the measures necessary to be taken in order to remedy insanitary conditions. These reports were transmitted to the Secretary of the Interior on December 13.

The conclusions of the board were in part as follows:

In regard to the Patent Office Building:

> The most important need at present is the relief of overcrowding, either by removing the excess of employees to some other building or by rearrangement of the force in the building, or, preferably, by a combination of these two measures, together with the improvement of the ventilation of the building as mentioned in the body of the report. Next in importance is the installation of an efficient power-driven pneumatic cleaning system for the purpose of effectually removing the excessive accumulations of dust and dirt present in many portions of the building. No other system of cleaning would be efficacious. Next in importance is the rehabilitation of the sewerage and drainage system of the building * * * , and finally the rehabilitation of the lighting system * * *.

In regard to the Pension Office Building:

> First. The entire plumbing installations in the east and west ends of the building are obsolete, improper, insanitary, and inadequate to the needs of the building, and should be removed and replaced by modern sanitary plumbing * * *.
>
> Second. As regards heating, lighting, ventilation, overcrowding, and cleanliness, * * * the conditions are such that they come very readily under the superintendent of the building, and may be remedied by him without great difficulty.

In regard to the old Post Office Building:

> The building as a whole may be said to be in better condition than the Patent Office Building. Overcrowding is not so general, more effort is made on the part of the occupants of the building to maintain better conditions as regards ventilation, and the lighting on the whole is better.
>
> * * * * * * *
>
> In order of importance the recommendations would stand as follows: First, the improvement of ventilation and the relief of overcrowding; second, the installation of an efficient, power-driven, pneumatic cleaning system; third, the rehabilitation of the sewerage and drainage systems along modern lines; fourth, the improvement of the lighting system * * *.

Compilation of National, State, and Territorial Health Laws.

As stated in the last annual report, one of the resolutions adopted at the Conference of State and Provincial Boards of Health, June 4–5, 1909, reads as follows:

> That it is the sense of this conference that each member of the conference be requested to send to the Surgeon General of the Public Health and Marine-Hospital Service a complete compilation of the laws of their respective States at the earliest opportunity, and that the Surgeon General be requested to have them printed; and further, that the secretary be instructed to communicate with the Surgeon General and cooperate with him in every possible way in compiling this document.

A copy of this resolution was received from the secretary of the conference, and in acknowledging its receipt he was informed that the securing of an appropriation for the purpose would receive consideration.

Uniformity of legislation in the different States composing the Union has always been admitted to be most desirable, and resolutions favoring its realization have been repeatedly passed by representative bodies, and especially at the recent conferences held in Washington by the governors of the several States. In so far as regards sanitary legislation, a compilation of the existing statutes must, no doubt, by bringing out resemblances and disparities and establishing a critical comparison, exercise a powerful influence toward the attainment of a uniform standard.

The importance of making a compilation of the National, State, and Territorial health laws was readily recognized. In fact the need for it had long been apparent, and copies of such laws as were received from time to time had been carefully filed for future use. It was recognized, however, that the compilation as contemplated in the above resolution would require much time and labor to render it valuable, and its publication when completed would necessitate a larger appropriation for printing than had heretofore been made, thus involving future congressional action.

In the meantime it was determined to undertake this compilation and on August 19, 1909, letters were sent to the secretaries or executive officers of the several State and Territorial boards or departments of health, requesting duplicate copies of the public-health laws that had been passed by the respective legislatures, and that were then in force. In response to this request, duplicate copies of laws were received from a majority of the States and Territories, and the District of Columbia. Single copies of the health laws were forwarded from five States, and five States and two Territories did not furnish any copies of their health legislation.

The limitations of the office force and the pressure of other more urgent work prevented giving immediate attention to the active editorial revision and reassembling, but arrangements were finally made in January last to begin the work in earnest.

An examination of the material collected soon revealed the fact that only a few of the States, such as Louisiana, Massachusetts, Michigan, and New Jersey, and the District of Columbia, had furnished what might be called a fairly complete compilation of health laws.

Probably through a misunderstanding of the proposed extent of the compilation, certain of the collections of laws sent did not include all those in the respective States and Territories that relate to the public health. In some cases only one law was given, the thought having evidently been that the only health legislation desired was that concerning the organization of the State board of health. In other cases, only brief abstracts were given; still in others, the laws were so interspersed with rules and explanations by the health authorities as to make hopeless the attempt to differentiate between them; while in still others, approaching far more the desideratum of completeness, the date of the compilations made them unreliable, no notice being taken therein of recent acts that had modified more or less the previous laws, and in many instances abrogated them. Absence of dates and references to old codes made obsolete by later revisions were also found to be frequent.

It was therefore realized that if the intended compilation was to have any standing and be of practical utility considerable more time and labor would have to be devoted to it than was at first thought necessary.

On account of the nonreceipt of laws from Arkansas, Nebraska, Nevada, North Dakota, Oregon, South Carolina, South Dakota, New Mexico, and Hawaii (copies of the North Dakota and South Carolina health laws were received afterwards), the statutes of these States and Territories on file in the Library of Congress were carefully searched and copies of the acts desired made.

The unevenness of the material received rendered necessary also the task of recurring to the original sources in order to obtain for each State a collection of laws covering, as far as possible, all sanitary subjects, taking as authority the last code, compilation, or revision of laws, and embodying in each case all subsequent amendments to the original law.

A review of the statutes shows that many laws directly affecting the public health have been enacted. On the other hand, even a larger number of laws appearing on the statute books have an indirect bearing on public-health matters, and while of interest to the sanitarian, are not, save in exceptional cases, of direct value to him in his administrative capacity. Some of these may be cited, such as the control of diseases of animals, the care necessary in the handling of oils and explosives, the sale of alcohol, and protection against industrial accidents.

In beginning the compilation, therefore, it has been deemed advisable to take up first those subjects that are of direct interest to sanitary officers, and regarding which there should be more or less uniformity throughout the country.

The first subject considered was accordingly the organization, powers, and duties of National, State, and municipal health authorities. A similar method has been adopted with respect to other subjects, such as the control of contagious and infectious diseases, suppression of nuisances, collection of vital and morbidity statistics, disposition and transportation of the dead, foods and drugs, water supplies and sewage, regulation of tenement and lodging houses, sale of poisons, eugenics, and the regulation of certain occupations.

When it is borne in mind that some of the compilations date back to the early nineties, that several State legislatures meet annually and all but one of the others biennially, and that all the acts passed during these many years are being examined, an idea may be had of the task undertaken by the bureau with a view to making the compilation of health laws complete and accurate. Even with the greatest care, some omissions may be made and errors may appear. In order to avoid this, it is intended to submit copies of the complete manuscripts to the respective health authorities, in order to secure their valuable cooperation.

The work has been progressing steadily, a great majority of the health laws have been either copied in toto, collated, or brought up to date, and it is expected to have the manuscripts ready for publication in the near future.

It is recommended that, as now planned, the laws be published in a series of pamphlets, each to cover a separate subject and prefaced by an analysis of the contents.

Compilation of Statistics Regarding Milk Dispensaries.

In Hygienic Laboratory Bulletin No. 41, which was prepared in 1907, there appeared tabulated statements regarding infants' milk depots, their objects, and work accomplished by them. As a result of inquires made at that time the fact was elicited that the first institution to dispense milk for the use of infants was founded in the United States in 1889, and that similar institutions had been established up to 1907 in at least 20 cities of the country.

The need of statistics on infant mortality and the factors underlying its causation has long been felt. The collection of such statistics, however, is a matter of great difficulty. Information is especially needed regarding, first, the amount of infant morbidity and mortality; second, the social and sanitary conditions bringing it about; and, third, the measures thus far taken for their reduction.

This matter was referred to by the retiring president of the American Association of Medical Milk Commissions at a meeting held in Chicago, June 1, 1908, and he urged the adoption of some plan looking to the collection of statistics of milk charities, the principle of which should be the assisting of individual physicians in cities to report the information in their possession.

When the compilation of statistics regarding infants' milk depots was made in 1907 it was the object to continue it, and when notification was received of the desire of the above-mentioned association to formulate some plan for the regular collection of such statistics, advantage was taken of the opportunity to cooperate and secure further statistics on the subject.

The following circular letter was accordingly prepared and sent out by the Surgeon General:

In continuation of its studies of milk in relation to the public health the bureau is compiling further information regarding "Infants' milk dispensaries" and "Consultations."

Will you please furnish as complete replies as practicable to the following questions? Your assistance in this matter will be much appreciated.

1. Name of organized agency, such as children's hospital, dispensary, milk depot, milk commission, or visiting assocation, for protection of infant life.
2. Give objects and methods of operation of agency and how maintained.
3. Have special measures been taken for the education of mothers in infant hygiene?
4. If so, state whether the instructions were given (*a*) by means of literature, or (*b*) by physicians and nurses.
5. Were the instructions given in the homes or at central consultation?
6. Does your agency distribute milk to infants and invalids?
7. Is the milk sold to the poor or given to them outright?
8. What proportion of its cost is charged?
9. What proportion of those benefited are (*a*) children? (*b*) invalid adults? (*c*) nursing mothers?
10. What proportion of the children are sick when first given the milk?
11. What proportion of the children are well while the distribution is in progress (*a*) in winter? (*b*) in summer?
12. What are the average ages of the children being fed?
13. Is literature on infant hygiene distributed with the milk?
14. How many individuals were thus fed during the past year, (*a*) children? (*b*) adults?
15. Is the milk distributed in bulk or in individual packages?
16. Quantity of milk distributed during the past year?
17. How many modifications or mixtures of milk are furnished by your agency?
18. For what ages are they designed?
19. Is the milk heated or used raw?
20. If heated, to what temperature is it subjected and how long?
21. Is heat applied winter and summer alike?
22. What grade of milk is employed in this work?
23. What is the mortality rate in your city for infants under 1 year of age?
24. What is the mortality rate among the number of children who have been fed on dispensary milk one month or over during the past year?

Following this inquiry, there were received a large number of replies from the officers of medical milk commissions, children's hospitals and dispensaries, milk-fund associations, visiting nurses' associations, and health departments of municipalities. The correspondence showed that there were in the United States, in 1909, 52 medical milk commissions, all having for their general object the encouragement of the production of clean milk, especially for the use of infants and invalids.

The information received indicates that there are at least 28 cities in the United States in which are located infants' milk depots, or milk dispensaries, for the relief of the poor. Many of these institutions maintain several stations for the distribution of milk and for giving advice with respect to infant hygiene.

An analysis of the data received indicates that the general object of such organizations is the protection of infant life either through the dispensing of proper milk or the giving of instructions regarding the care of infants, or both. The majority of them are conducted through the dispensaries and maintained almost entirely by private philanthropy.

All of the charities in question take special measures for the education of mothers in infant hygiene. Information was also secured as to the agencies that dispense milk; whether the milk is sold or given; the percentage of children and adults benefited; the percentage of children sick on application; the average age of the children fed; the number of infants and adults fed during 1909; the amount of milk distributed and its character; and the mortality rate among children fed one month or over during 1909. These data have been tabulated, and published in a bulletin of the service.

The compilation is of value as showing the efforts being made for the protection of infant life. Similar compilations in the future would tend also to determine the relative value of the methods adopted, particularly as to the relative value of dispensing milk as compared with methods where milk is not dispensed, but relief afforded through educational measures.

In order that comparable statistics shall be available, however, careful records must be kept from day to day by the officers of the milk dispensaries themselves and, if practicable, such records should be uniform in character.

Cooperation with the Public Health Education Committee of the American Medical Association.

On December 23, 1909, the chairman of the public health education committee of the American Medical Association requested the cooperation of the service with that committee in presenting addresses and giving information regarding public health matters to mothers' and teachers' organizations, church and social settlements, and women's clubs.

The object of this committee, as stated in a pamphlet setting forth the plan of work for 1909–10, is to disseminate accurate information concerning the nature and prevention of disease and the general hygienic welfare of the people. Following is an extract from Dr. Morton's letter:

> We believe it will be of great educational value to the women of America to know more of the work which protects their homes from epidemics, and therefore shall be glad to have the cooperation of some of the officers working in our country's service along these lines.

Inclosed is a leaflet showing our plan of work. This is in use already in 40 States, and several of the topics bear to some extent on the work of your department. We inclose also a list of our State secretaries and will be glad to have you put such officers as you think best in touch with them.

A large number of subjects were suggested by the committee as suitable for such lectures, among them being the following: The relation of pure water to the public health; water-borne diseases; the value of exercise and rest to the public health; the prevention and cure of tuberculosis; the air we breathe and the value of ventilation; the relation of flies, mosquitoes, water bugs, and other insects to public health; pure milk and infant hygiene; the prevention of Fourth of July injuries and tetanus; the causes and prevention of blindness.

In consequence of this request letters were written to medical officers of the service stationed at the following places, informing them of the request and inquiring whether they would be willing to cooperate with the committee: St. Louis, Mo.; Baltimore, Md.; San Francisco, Cal.; Evansville, Ind.; Charleston, S. C.; Seattle, Wash.; Cleveland, Ohio; Ellis Island, N. Y.; New York, N. Y.; Portland, Oreg.; Pittsburg, Pa.; Philadelphia, Pa.; Los Angeles, Cal.; Memphis, Tenn.; Milwaukee, Wis.; Norfolk, Va.; Louisville, Ky.; Chicago, Ill.; Boston, Mass.; New Orleans, La.; and Detroit, Mich.

Affirmative replies were received from 16 of these officers, and the secretaries of the committees in the respective States and cities were so informed by the bureau and requested, March 24, 1910, to confer with the officers and furnish them copies of the plan of work.

HYGIENIC LABORATORY.

The investigations and routine work of the Hygienic Laboratory have been continued as in previous years, and the influence of the laboratory as a public health agency has been extended.

Some important changes in the personnel have been made. On October 1, 1909, having been granted leave of absence for one year to enable him to accept a professorship in Harvard Medical School, Surg. M. J. Rosenau was relieved from duty as director. Passed Asst. Surg. John F. Anderson, who had been assistant director for a number of years, was detailed as director from October 1, 1909, and Passed Asst. Surg. Edward Francis was assigned as assistant director on November 5, 1909.

Personnel.—The personnel at the laboratory on June 30, 1910, consisted of the director, the assistant director, a professor of zoology, a professor of pharmacology, 9 commissioned medical officers, 2 pharmacists, 8 technical assistants, an artist, acting librarian, and 27 attendants, making a total of 52.

The director, in his annual report, has invited attention to the difficulty of retaining the services of certain laboratory attendants because of the low salaries given. The work that some of these men do is of a particularly dangerous and hazardous nature, and the salaries received by some of them—varying from $40 to $50 a month—are entirely inadequate compensation for the duties performed and the dangers to which they are exposed. The director also invites attention to the desirability of enlarging the personnel of the division of pathology and bacteriology by the detail of additional commissioned medical officers to undertake studies of public-health problems that are awaiting solution.

Buildings and grounds.—The equipment of the addition to the laboratory has been completed.

The necessity for a building to be used as a combined animal house, stable, carpenter and machine shop, to replace the present frame buildings, is very urgent, and an appropriation of $25,000 is recommended. In connection with this recommendation attention is invited to the fact that the present animal house, stable, and carpenter shop are constructed of wood. These have now been in use for over six years and, as they were originally intended as temporary makeshifts, they are rapidly becoming unserviceable. In addition, the quarters and additional buildings connected with the Naval Medical School have now been completed and some of them face the unsightly frame buildings on the laboratory reservation. One of these buildings is less than 90 feet distant from the frame animal house, a distance which, if the latter should take fire, would seriously endanger the buildings of the Navy and the main laboratory.

On account of the difficulty during the past winter of keeping the animal house properly heated the number of animals raised was less than usual, and in addition the breeding animals suffered from two severe epidemics. The necessity for a well-constructed rat-proof building is therefore very urgent.

The building should be of brick construction, cement base, two stories in height, and fireproof. The part for the breeding of small animals should contain, in addition to the breeding pens, a room for special work. The stable should contain sufficient room for at least four horses and a room for the laboratory wagon. The building should be heated by steam.

The addition should contain a machine shop, a carpenter shop, and two special rooms of 2,000 cubic feet capacity for the testing of disinfectants. The upper floor of the building could be used for the storage of lumber and material used in connection with the repair of the laboratory machinery.

During the past fall and spring the grading of the front portion of the laboratory grounds was completed and an entrance with steps was also constructed. The sundry civil bill contains an item of $15,000 for additional grading and construction of retaining wall. This amount should place the grounds of the laboratory in a most satisfactory condition, but until the present frame animal house and carpenter shop are removed it will not be possible to satisfactorily grade the entire reservation.

Journal Club.—The Journal Club, which is composed of officers attached to the laboratory, has met at regular intervals. In addition to the review of articles in current journals, at times special subjects have been selected for review and discussion. The club is of great value in keeping the officers informed as to current research work and literature.

AID TO OTHER BRANCHES OF THE GOVERNMENT.

During the past year the laboratory has continued to render aid to other branches of the Federal Government in accordance with requests from the proper officers.

District health office.—During the fiscal year, 122 samples of water have been examined at the request of the health officer of the District of Columbia and reports made thereon. These specimens included samples from the water supply of the various public schools in the District, wells that were used for furnishing drinking water, and a number of bottled waters.

Isthmian Canal Zone.—Ten treatments of antirabic virus were furnished the Isthmian Canal Commission for use on the Canal Zone.

Civil Service Commission.—On three occasions papers of applicants for technical positions have been forwarded to the laboratory for rating. It is believed that this assistance from the laboratory has been of aid to the commission in the proper selection of applicants for certain technical positions such as those of chemist, bacteriologist, pathologist, and pharmacologist.

Bureau of Animal Industry.—At the request of the chief of the pathological division, one of the assistants in that division was instructed in the laboratory as to the technique in testing antitetanic serum, it being purposed by that bureau to examine the antitetanic serum for veterinary use on the market.

Geological Survey.—At the request of the Director of the Geological Survey, seven samples of blood from miners who had been killed in a mine explosion were examined to determine whether death was due to the force of the explosion or to carbon monoxide poisoning. In only five samples was it possible to make an examination and all five were found to contain carbon monoxide in relatively large amounts, thus leading to the conclusion that death was in all probability due to carbon monoxide poisoning.

Bureau of Chemistry.—Two officers of the Hygienic Laboratory were called upon for expert testimony in regard to certain legal questions involved in the enforcement of the pure food and drugs act. One of these, at the end of the year, was in Kansas City, giving testimony in regard to the bleaching of flour, having been summoned at the request of the Secretary of Agriculture.

Superintendent of the Capitol.—At the request of the Superintendent of the Capitol, an examination was made of the air supplied to the Senate and House Chambers. This examination included a study of the air at the inlet, a study of the air at the outlets, and a large number of examinations of air within the chambers, both on the floor and in the galleries.

Bureau of Engraving and Printing.—At the request of the Director of the Bureau of Engraving and Printing, a number of plate printers in that bureau who were suffering from a dermatitis of the hands and arms were examined with a view of determining the cause of the same, particularly as to whether the affection was contagious. Also, at the request of the director, some experiments have been made to determine the efficacy of a method of cleaning old paper money so that, by a process of laundering, it could be reissued instead of being destroyed, as is now the practice.

Examination of Government employees for tuberculosis.—During the fiscal year 14 persons were examined at the request of their administrative superiors to determine if they were suffering from tuberculosis. Of these it was found that all but four presented evidences of the disease.

Naval Medical School.—The Director of the Hygienic Laboratory delivered six lectures to the students of the Naval Medical School upon antitoxins, vaccine, disinfection, immunity, and related subjects.

SCOPE OF INVESTIGATIONS.

In addition to the special investigations already briefly outlined and which were conducted through the various divisions of the Hygienic Laboratory, being in themselves not entirely laboratory procedures, there remain other equally important researches which will be discussed under the appropriate divisions. The special work that has been published during the year as bulletins or reprints will be found under "Service publications."

DIVISION OF PATHOLOGY AND BACTERIOLOGY.

A considerable proportion of the special investigations during the year have been conducted through the Division of Pathology and Bacteriology. Besides those already given especial mention, there remains other work of a routine or research nature carried on in this division.

Studies upon anaphylaxis and immunity.—Studies upon anaphylaxis were continued and the results were published as two laboratory bulletins. In the first paper it was shown that death could be prevented in a large number of sensitized animals by the previous administration of chloral hydrate and adrenalin accompanied by artificial respiration with pure oxygen.

In the second study work was mainly done with the anti-bodies concerned. During the past four years 6 bulletins have been issued from the laboratory upon this subject, and in addition 14 papers have been published in medical journals.

There has been no work that has brought more notice to the high class of research done in the laboratory than the studies on anaphylaxis, and it is particularly gratifying that the first papers upon this subject published in America came from the laboratory.

Examinations of water.—A large number of samples of city water were examined in connection with the continued study of typhoid fever in the District of Columbia. Since January 1 these examinations have been made only once a week, with the exception of the samples that have been examined at the request of the District health officer.

Dr. Frost isolated from the filtered Potomac water during the early part of the fiscal year an organism (*Pseudomonas protea*) which was found to be agglutinated by the serum of typhoid-fever patients. The results of this study have been published as a laboratory bulletin.

Examinations of pathological specimens.—A smaller number than usual of pathological specimens were submitted to the laboratory by the officers at various service stations for examination and report. Attention is again invited to the great desirability of officers sending specimens to the laboratory for determination. These specimens are of value not only to the laboratory as a means of instruction to the student officers, but manifestly would be of distinct value to the officers submitting them.

THE DIVISION OF ZOOLOGY.

International Commission on Zoological Nomenclature.—Cooperation with the International Commission on Zoological Nomenclature has been continued through the Hygienic Laboratory, the professor of zoology serving as secretary of the commission. A number of cases have been submitted during the year for interpretation under the code. The Smithsonian Institution has provided clerical help for the commission, and also for the publication of decisions.

Index catalogue of medical and veterinary zoology.—Through the Division of Zoology cooperation has been continued with the Zoological Division of the Bureau of Animal Industry in the preparation of an index catalogue of medical and veterinary zoology. Of the authors' catologue, the letters A to T, inclusive, have been published. The letters U, V, and W are now ready for the printer and the letters X, Y, and Z are now being edited for the press.

The manuscript for the *Cestoda* has been held from the press pending the completion of the authors' catalogue, and the manuscript for the *Nematoda* is being typewritten. Work has now been begun on the host catalogue.

Determination of zoological specimens.—The division of zoology has continued to make zoological determinations of animal parasites for physicians, boards of health, etc., and a large number of such determinations, including many fecal examinations as aid in diagnosis, have been made.

New trematode parasites.—Studies of animal parasites have been continued, and descriptions of several new trematodes from fresh-water fish are being completed and in preparation for publication.

Straw itch.—Interest in the dermatitis caused by the bite of a certain straw-infesting mite (*Pediculoides ventricosus*) discovered a year ago in the Hygienic Laboratory has continued and information has been received indicating its very wide distribution throughout the United States. With the approval of the bureau the Hygienic Laboratory has cooperated with the Bureau of Entomology of the Department of Agriculture in the study of the activities and distribution of this mite and also in the circulating of information with respect to it.

HOOKWORM DISEASE.

During the fiscal year laboratory investigations of hookworm disease were continued, especially with reference to identification of specimens and determination of the prevalence of the infection among school children. Studies of *Uncinaria americana* were also made with reference to their viability under different conditions. In addition, seven lectures were presented by Prof. C. W. Stiles on request of State health authorities or medical associations. The work has more firmly established the importance of this parasite as a menace to the public health and emphasized the necessity of preventive measures.

In October, 1909, Mr. John D. Rockefeller announced a gift of $1,000,000 for the eradication of hookworm disease. The administration of this fund has been placed in the hands of a board of trustees, and the administrative office has been located in the Union Trust Building, Washington, D. C.

Prof. C. W. Stiles, of the Hygienic Laboratory, who, by his investigations had established the identity of the *Uncinaria americana*, its prevalence in the United States, and its influence as a cause of a large amount of invalidism, was made the scientific secretary of the Rockefeller Commission for the Eradication of Hookworm Disease by the board of trustees. By this arrangement his knowledge of the situation was made available in the campaign of eradication, and the results of his investigations continued in the laboratory could be immediately made of practical application in the eradication of the disease.

By his gift in the interest of the public health of the United States Mr. Rockefeller has performed a valuable service. It is a matter of significance that while the Rockefeller fund will, according to the terms of the gift, be used specifically against hookworm disease, the same preventive measures which are instituted against this malady will of necessity result in a great decrease in typhoid fever, amebic dysentery, Cochin-China diarrhea, the fly pest, and other soil-pollution evils.

DIVISION OF PHARMACOLOGY.

Although the work of this division has greatly expanded in the last year there has been no increase in the size of the staff. The only change was occasioned by the resignation of Mr. R. de M. Taveau October 1, 1909, his place later being filled by the appointment of Dr. G. A. Menge.

Prof. B. F. Lovelace, of the University of Alabama, and Prof. R. A. Hatcher, of Cornell University, received, in accordance with the civil-service regulations, temporary appointments for the summer and early fall of 1909; the former undertook work on the determination of some of the physical constants of pharmacopœial substances and the latter collaborated in the preparation of the Digest of Comments on the United States Pharmacopœia. Dr. Menge was, at the request of the board of trustees of the pharmacopœial convention, given the privilege of working in the laboratory for a period of six months. He carried on an extensive investigation on the pharmacopœial melting points. Prof. C. W. Edmunds, of the University of Michigan, and Mr. R. de M. Taveau received temporary appointments as special experts for the summer of 1910.

The space available for this division has become inadequate, and it will not be possible to expand the work in some very desirable directions without additional space. This need is especially urgent in connection with experimental work on important and potent drugs and for the work on the Pharmacopœia. In connection with the latter the laboratory is fortunate in being able to collect, through the courtesy of different pharmaceutical associations and the editors of pharmaceutical journals of this and other countries and without expense to the Government, a valuable library relating to the pharmacopœias of the world; the space for caring for this valuable collection in the most desirable manner is inadequate.

Pharmacopœial work.—Many of the studies made in the division during the year had an important bearing on the Pharmacopœia, especially in relation to revision, and this work has been mentioned in outlining the relations to that publication.

Work on the standardization of digitalis.—The work on this subject begun in 1908 has been continued. Particular attention has been given to the physiological activity of the leaves of different age, of the methods of preserving the leaves, and the best menstrua for preparing galenical preparations with especial reference to the international standard. A large number of commercial preparations, especially those of so-called active principles, were investigated. The work has again emphasized the great variability of the preparations of this very important drug and the need of a standard method of assay, a subject which is also attracting the attention of foreign governments.

Standardization of epinephrin.—The various methods proposed for assaying epinephrin compounds were critically examined and modified, thus rendering them more accurate. A number of synthetic compounds of the epinephrin series were tested and their relative toxicity and physiologic activity determined.

Samples of the various commercial solutions of epinephrin were tested and found to vary from 3¾ to 100 per cent of their labeled strength. A considerable quantity of chemically pure epinephrin was prepared and is kept as a standard for future comparisons of the commercial products. There have been a number of requests from manufacturers for samples of this standard preparation.

Work on the thyroid.—Work has been continued on the thyroid gland with the object of proposing methods of assay which will insure more uniform commercial preparations and also throw light on the physiology and pharmacology of this gland. The standard of iodine content recommended two years ago has been adopted by some manufacturers. The comparative efficiency of a large number of iodine compounds in increasing the activity of the thyroid was investigated; one of the results was the discovery that bladderwrack, *Fucus vesiculosus*, contains a thyreotropic iodine compound, i. e., an iodine compound having a special affinity for the thyroid; such a compound has long been recognized as a desideratum in the treatment of goiter, a disease which has recently been found to be endemic in certain parts of the United States.

The experiments also gave results by which the iodine compound in thyroid can be sharply distinguished from all other iodine compounds; by this method it is possible to demonstrate the presence of thyroid in many secret "antifat" nostrums, the extensive use of which is a distinct menace to health.

A large number of experiments were also performed to determine if certain foods have specific effects upon the thyroid and distinct evidence was obtained that this is the case. Work on this line is being continued. The close relation between the activity of the thyroid and the mental and physical development of children and its relation to certain forms of insanity makes this a subject of much importance and it is hoped that the methods of investigation originated here will throw light on a number of important problems. This is a part of a larger investigation on the specific effects of different foods—a subject which has received considerable attention on the part of those interested in animal husbandry and the breeding of animals, but largely neglected as it relates to the growth and health of human beings.

The work on the thyroid has involved a reexamination of the analytical methods for determining iodine in these glands. A study of the seasonable variation of the iodine content of the thyroid was begun. Experiments had shown that the resistance of animals to certain poisons varies according to the season and there is considerable evidence that these variations are due in part to variations in the activity of the thyroid.

Bleached flour.—The Secretary of Agriculture requested the Secretary of the Treasury that this division undertake an investigation of bleached flour in regard to its possibly injurious effects upon man. A somewhat extensive series of experiments were performed, the results of which are incorporated in Bulletin 68. The effect of small amounts of nitrites (the alleged poisonous material in bleached flour) upon the toxicity of certain drugs was investigated. The results show that some of the latter are converted into very active poisons by small amounts of nitrites.

Other research work.—The Division of Pharmacology has cooperated with the Division of Bacteriology in a study of certain of the physiological aspects of anaphylaxis. It was determined that certain drugs, especially oxygen and chloral hydrate, greatly modify the action of the second injection of serum, decreasing the mortality by as much as 66 per cent.

In a more recent paper it has been shown that smooth muscle may become highly sensitized towards foreign protein. One of the chief sources of danger from injecting serum is thus shown to consist in its action upon the smooth muscle of the lungs, heart, and arterioles.

A considerable amount of crystalline egg albumin was prepared in this division for the work on anaphylaxis.

Work has been continued on the pharmacology of choline and similar compounds. An extensive comparison was made between the chemical constitution of these compounds and their toxicity and effects upon the circulation.

As a member of the pellagra commission, Dr. Reid Hunt, professor of pharmacology, attended the national conference on pellagra November, 1909, and has since carried on a number of experiments on the limitation of corn meal as a food and on the effects of feeding corn oil and corn meal which has spoiled.

Further work was done on the toxicity of mixtures containing acetanilid and caffeine. The results were published in Bulletin 53. Similar studies have been made on acetphenetidin and para-amidophenol.

Miscellaneous examinations.—The examination of samples of drugs purchased by the purveyor for use in the marine hospitals of the service has been continued as in past years, and it is to be noted that the percentage of inferior drugs continues to diminish. The majority of those which are rejected are such as deteriorate naturally, and therefore can not be charged entirely to neglect on the part of the manufacturer. Samples of drugs, etc., from other sources, such as the council on pharmacy and chemistry of the American Medical Association, other divisions of the laboratory, the Post Office Department (in connection with the exclusion from the mails of certain fraudulent nostrums), and those required in the division investigations have also been examined during the year, making a total of some 120 for which analytical reports have been made.

Cooperation with the American Medical and American Pharmaceutical Associations, etc.—In addition to cooperation with the American Pharmaceutical Association in preparing digests of comments on the National Formulary, as mentioned above, this division has, under approval from the Secretary of the Treasury, cooperated with the council on pharmacy and chemistry of the American Medical Association. Two members of this division are members of this council, and among the contributions made to this work was the preparation of the chapter on serums, vaccines, etc., for "New and Nonofficial Remedies." Members of this division attended the meetings of both of these associations as official delegates. They contributed many papers to the programs and were elected to a number of offices, such as secretary and chairman of the section on scientific papers of the American Pharmaceutical Association, secretary of the section on pharmacology and therapeutics of the American Medical Association, chairman of the committee on the United States Pharmacopæia of the American Medical Association, member of the committee for revising the National Formulary, member of the American Pharmaceutical Association committee on the United States Pharmacopœia, etc.

The professor of pharmacology attended, as an official delegate, the Twelfth International Congress on Alcoholism held in London, England, July, 1909, and the Sixteenth International Medical Congress in Budapest in September, presenting papers on both occasions.

DIVISION OF CHEMISTRY.

The work of this division has been continued. Expert opinions have been given, analytical and research studies made, and scientific reports have been prepared. The general character of the work has been maintained, although there has been some curtailment on account of the resignation of Prof. J. H. Kastle, chief of the division, October 1, 1909. His place has not been filled.

Investigations were made and reports rendered on the pasteurization of milk and the distribution of the ventilating air in the United States Capitol Building.

The analytical work of the division has included analyses as follows: Thirteen samples of water, 79 samples of drugs, 2 samples of patented disinfectants, 1 sample of copper wire, 6 samples of cold-tar oil (disinfectants), and 22 samples of embalming fluid. Seven specimens of human blood were examined for carbon monoxide, and 2 samples of meat extracts were analyzed.

The examinations of the air of the Capitol Building involved a large number of determinations of carbon dioxide, carbon monoxide, ammonia, and sulphur. Determinations were also made of the amount of formaldehyde present in various solutions of that gas, and of the amount of available chlorine in chlorinated soda solutions.

The research work of the division included, first, the extraction of maize oil for use in connection with the investigation of the relation of maize to pellagra. In this work an improved form of extraction apparatus was devised and constructed. Second, a study of digestive processes in relation to the possible connection of fatigue products with pellagra. Third, a chemical study of the air supply of the Capitol Building to determine its purity. Fourth, the preparation of standard solutions of formaldehyde, phenol, mercuric chloride, and chlorinated soda. Fifth, a study of cold-tar oils in relation to their use as disinfectants. Sixth, a study of a sulphur-coat mixture designed for sulphur disinfection.

Publications and communications.—The following reports, embodying the results of investigations carried on in the divisions, have been prepared and published or accepted for publication in various scientific journals. The articles published as service reports will appear under "Service publications."

Further studies on the application of the Volhard method to the estimation of alkaloids. By Elias Elvove; Journ. Amer. Chem. Soc., January, 1910.

The use of anhydrous sodium sulfite in the preparation of Endo's medium. By Joseph H. Kastle and Elias Elvove; Journ. Infect. Diseases, November, 1909.

A note on the substitution of anhydrous sodium sulfite for the hydrated variety given in the U. S. Pharmacopœia; Amer. Journ. Pharmacy, May, 1910. By Elias Elvove.

The preparation of platinum black. By F. Alex. McDermott; Journ. Amer. Chem. Soc., March, 1910.

A note on certain color requirements of the U. S. Pharmacopœia. By Norman Roberts; Amer. Journ. Pharmacy, April, 1910.

The Fahrenheit hydrometer as a urinometer. By Norman Roberts; Military Surgeon, May, 1910.

A Freezing Microtome. By Norman Roberts; Military Surgeon (in press).

An Extraction Apparatus. By Norman Roberts; Amer. Chem. Journ., May, 1910.

A note on the preparation of chlorinated soda solution. By Elias Elvove; Amer. Journ. Pharmacy, April, 1910.

A suitable ultimate standard for the volumetric solutions of the U. S. Pharmacopœia. By Elias Elvove; Amer. Journ. Pharmacy, May, 1910.

A preliminary note on a new form of sulfur-burning stove. By Norman Roberts and F. Alex. McDermott (submitted for publication in the Public Health Reports).

FEDERAL PLAGUE LABORATORY, SAN FRANCISCO, CAL.

SUMMARY OF SCIENTIFIC WORK AT LABORATORY.

A number of important matters in connection with the purely routine work at the station have been given considerable time and attention.

Plague among ground squirrels and rodents.—Until the service began the extensive campaign to determine the extent of the plague infection among the ground squirrels of California, but little was known of the pathology of this interesting and important disease in rodents. Careful records have been kept of every infected squirrel that has been sent to the laboratory, and with these records as a basis, the pathology of ground-squirrel plague has been given a scientific status. This, as will be readily understood, is a matter of great importance. Perhaps one of the most interesting facts in connection with the natural plague among ground squirrels is its tendency to become subacute and chronic. Many of the squirrels that have proven to be infected showed nothing beyond a purulent focus in one of the peripheral lymphatic glands.

A wood rat sent to the laboratory from Alameda County, Cal., presented lesions that led to the suspicion of its being plague infected, and as a result of an extensive and searching investigation the diagnosis of plague was established. It is believed that this is the first case of plague infection ever found among wood rats.

Subacute plague in man.—One of the human cases of plague that came under observation was of more than usual interest. The case was one in which death occurred on the sixteenth day. The lesions found at autopsy were those of a chronic pyæmic process, and without a knowledge of the previous history the case would scarcely have been regarded as one of plague infection. Plague bacilli, however, were recovered in cultures from some of the lesions. Subacute plague in man, of which this case was an example, is rare, but does occur from time to time in epidemics of the disease.

New growths in rodents.—Advantage has been taken of the opportunity presented by the large volume of material to be found at the laboratory to make a study of new growths in rats, and an investigation of those found in squirrels is now under way.

A plague-like disease in squirrels.—Of the purely experimental work the most important was the discovery of a plague-like disease in ground squirrels. This disease is of great importance, not only because it produces lesions in ground squirrels which resemble those of plague, but from the fact that it produces lesions in the guinea pig that are almost indistinguishable from those of plague. There is, however, no possibility of confusion with plague, providing careful microscopical and bacteriological examinations are carried out.

Rodent susceptibility to plague.—Studies upon the susceptibility to plague of the various rodents indigenous to California have been conducted. The experiments appear to indicate that the chipmunk (*Callospermophilus* (*Citellus*) *chrysodeirus*) and the weasel (*Putorius xanthogenys*) may be readily infected, while the California pocket gopher (*Thomomys bottæ*) was found to be highly resistent to the infection.

A study was made of a few of the rodents from the Fort Stanton Sanatorium Reservation in New Mexico. This work showed that the rock squirrel (*Citellus grammurus* Say), the eastern desert wood rat (*Neotoma albigula angusticeps* Merriam), and the prairie dog (*Cynomys ludoviciana arizonensis* Mearns) were all highly susceptible to plague infection. This investigation was undertaken, as it seemed desirable to ascertain the susceptibility of the various rodents that might serve as connecting links in a chain between the Pacific coast and other places in the United States.

Fleas as plague carriers.—As it has been definitely shown by workers in India that plague was usually transmitted among certain rodents by means of rat fleas, it was regarded as of great importance to determine whether the fleas commonly found on squirrels would serve as plague carriers. Several experiments to determine this point have been carried out and the results show beyond question that plague may be very readily carried from squirrel to squirrel, from squirrel to guinea pig, and from squirrel to rat by means of the common squirrel flea (*Ceratophyllus acutus*).

Throughout the year observations have been made on the prevalence of the Siphonaptera on the various rodents that have come to the laboratory. It is, perhaps, worth noting here that the evidence so far as it goes, does not indicate that there is any seasonal prevalence of fleas on the rats in the vicinity of San Francisco. The bionomics of fleas and the effects of germicides and insecticides on these parasites have been made the subjects of exhaustive investigations.

Student demonstrations.—The educational opportunities afforded by the laboratory have not been overlooked. Students of hygiene from several medical colleges have been brought to the laboratory by their teachers for the purpose of learning at first hand the manner in which the work was conducted. For these occasions special demonstrations have been arranged and each student has been shown as much of the pathology and bacteriology of plague, and been instructed in as much of the relation of rodent to human disease as was possible in the limited time at their disposal.

Specimens of rat leprosy.—In addition to the pathological specimens of plague-infected guinea pigs, rats, and ground squirrels furnished to medical colleges, and on account of the widespread belief among scientists that a careful study of the leprosylike disease of rats would result in extending our knowledge of leprosy in man, white rats inoculated with rat leprosy have been shipped to directors of a number of research laboratories.

PATHOLOGICAL SPECIMENS FURNISHED TO MEDICAL COLLEGES.

On July 30, 1909, the officer in charge of the Federal plague laboratory in San Francisco reported that applications had been received, from time to time, from medical colleges in that State to furnish them pathological tissues of plague-infected guinea pigs, rats, and ground squirrels, and that this had been done. He also stated that there was an abundance of such material which would be useful to other medical colleges for demonstration purposes.

It was recognized that by distributing these pathological specimens, there would result a better knowledge of plague among rodents on the part of students who would receive their degrees, and instructions were accordingly issued to honor requests for such specimens. Although it was understood that the pathological tissues in question and mounted specimens of the plague bacillus would be prepared in such a manner as to absolutely preclude the possibility of conveyance of infection, instructions were also issued to inform the recipient in each instance that all necessary precautions had been taken, and that the specimens had thereby been rendered innocuous.

Public notification was also subsequently made that medical colleges and medical museums would be furnished specimens on request. In consequence of this announcement, the above-mentioned laboratory has completed the supplying of medical colleges in the United States, the expense being borne by the colleges themselves. Circular letters offering to furnish specimens were sent to 155 colleges; 104 requests were received, and that number supplied with specimens.

Expressions of appreciation for the receipt of the specimens have been received, and by availing themselves of this offer, medical colleges are able by means of safe specimens, to demonstrate the lesions of plague, and thus give practical instruction regarding a disease which is of public-health importance at the present time.

NATIONAL LEPROSY INVESTIGATION STATION.

The leprosy investigation station has been in progress of organization and construction for nearly four years. On account of the isolation of the site selected and because of its close proximity to the Territorial leper colony, the greatest difficulty was experienced in the erection of the buildings and the opening of the hospital, and at times the obstacles seemed insurmountable. Not only was the actual construction of the buildings delayed, but provisions for water supply and landing facilities had to be made separately, necessitating an appeal to Congress for additional appropriations to supply these needs.

As stated in previous reports, no contractor could be found who would agree to erect the buildings at a reasonable cost, and after a long delay it became necessary to send an officer of the department to the island of Molokai with instructions to accomplish the erection of the buildings. By this arrangement the buildings were finally completed in July, 1909, and an adequate supply of water provided.

The proposals received for screening the station were excessive and had to be rejected. In the meantime it was deemed hazardous to the personnel to open the station until it was properly screened, causing further delay until new proposals could be invited and accepted. The necessary wire cloth had to be made, and the time consumed, together with the time occupied in its transportation from the Eastern States to Honolulu, further delayed the opening of the hospital and laboratory on Molokai until December 23, 1909.

Notwithstanding these unavoidable delays, steady progress has been made in the scientific investigations, and a number of reports of results published.

With the opening of the hospital station on December 23, 1909, the matured plans were finally put in operation, and in addition to the study of incipient cases of leprosy, which had hitherto been carried on, systematic investigations of a clinical and laboratory nature were inaugurated on the island of Molokai. It will thus be seen that prior to December 23, 1909, the complete plans of investigation were not in full operation, but at the end of the fiscal year a large amount of scientific work had been performed.

REPRESENTATION AT INTERNATIONAL CONFERENCE AGAINST LEPROSY.

In August, 1909, Passed Asst. Surg. D. H. Currie, director of the leprosy investigation station, was detailed to attend the Second International Conference against Leprosy as one of the representatives of the United States, this congress being held at Bergen, Norway, August 16 to 19, under the auspices of the Norwegian Government.

Dr. Currie arrived at Bergen a few days prior to the opening of the conference, and utilized the intervening time in visiting the leper hospitals in Bergen, as well as calling upon several of the well-known leprologists of that city, notably Dr. G. A. Hansen. During the conference Dr. Currie presented a report upon the status of leprosy in the United States and the methods that are being adopted for its control. He also presented two other papers upon leprosy, based upon work performed at the leprosy investigation station. These reports and a detailed report of the proceedings of the conference have since been published.

SCIENTIFIC INVESTIGATIONS MADE.

During the year there were received in the hospital at Kalawao nine patients for scientific study and treatment, and the studies of incipient cases of leprosy at Kalihi were continued.

One medical officer and most of the laboratory force were employed at the Kalawao station. The director spent most of his time at this station and performed the majority of his experiments there. The assistant director, Dr. Walter R. Brinckerhoff, was on duty at the Kalihi laboratory until his resignation, April 15, 1910.

The character of the studies, owing to the difference in the opportunities presented, varied somewhat at the two places. At Kalawao the following subjects were investigated: Insect transmission; treatment of advanced cases of leprosy; studies upon rat leprosy; cultural attempts; clinical and epidemiological studies bearing upon the subject of transmission, and other investigations of a minor character. At Kalihi, on the other hand, investigations were made of the diagnosis and treatment of early cases of the disease, and, in addition, attempts were made to cultivate the bacillus of leprosy by methods similar to those employed at the Kalawao laboratory.

Much of the research work above referred to is still in operation, and it is therefore impossible to state positively what the results will finally be. In several instances, however, the work has been completed or carried to a point which justifies a positive statement as to the outcome of the experiments. The following is a brief summary of these results, as stated by the director in a report dated July 12, 1910.

(1) The examination of 500 mosquitoes that had fed upon tubercular lepers, many of which insects were seen to actually puncture a leprous nodule, demonstrates that the mosquito does not imbibe the bacillus of leprosy when it is allowed to feed upon lepers in the manner mentioned.

(2) The house fly, *Musca domestica*, and certain other dipterous insects belonging to the class commonly called "blow fly," *Sarcophaga pellinervis*, *Sarcophaga barbata*, *Volucella obesa*, and *Lucilla*, species undetermined, when allowed access to the discharge of leprous ulcers, imbibe large numbers of bacilli, and these insects, when thus infected, will discharge these bacilli for several days thereafter. The number of bacilli transferred by this means from the ulcers of lepers to the skin and mucosa of healthy man is large, the feces of these insects not infrequently showing 20,000 to 30,000 per speck deposited. The knowledge that existed at the time when these experiments were made did not permit determination as to whether the bacilli were alive at the time when they were deposited by the insect, but until this technical gap can be filled the presumption is that such insects not infrequently carry the infecting agent from man to man.

(3) A large amount of the time of the laboratory force of the leprosy investigation station has been employed since March 1, 1910, in cultural investigations similar to those of Clegg, of Manila. Clegg claims that he cultivated the bacillus of leprosy from 6 out of 10 cases, and in two cases succeeded in obtaining the organism in pure culture. His method was to place leprous material, obtained from a nodule, or from the spleen of a leper, with a mixed culture of cholera bacilli and amœbæ.

After many failures in the early attempts to successfully employ this method for the cultivation of the leprosy bacillus, Dr. Currie reported that they had grown an acid-fast bacillus, indistinguishable from the bacillus of leprosy, from the nodules of two cases of leprosy, and that in the case of two other cultures from two other cases of leprosy it was reasonably certain that growth had occurred. The bacilli in the case of the two positive cultures were reported as being absolutely typical of the bacillus of leprosy, and while it is necessary to isolate them in pure culture, the fact that the organisms in question are leprosy bacilli can hardly be doubted. Until a pure culture is obtained it can not be stated positively whether all the organisms in the mixed culture are acid fast or not, or whether there is a stage, as claimed by some investigators, in which the organism does not take the acid-fast stain. So far, however, the laboratory staff had not obtained any form in their cultures other than the typical acid-fast bacilli, the cholera Spirilla, and amœbæ. It is difficult, therefore, to believe that there is any other form of the lepra bacillus on artificial media than the typical acid-fast stage with which all are familiar.

In the two cases in which Clegg succeeded in isolating the organism in pure culture he eliminated the amœbæ and cholera bacilli by heating to 60° centigrade for 30 minutes. At this temperature he found the lepra bacillus did not succumb, but the symbiant organisms did. The first culture secured by the staff of the leprosy investigation station was contaminated by staphylococcus, which had a high thermal death point, and this fact, up to July 12, prevented the isolation of the lepra bacillus by means of heat from that particular culture. While the second successful culture of the lepra bacillus was not contaminated, sufficient time had not elapsed to determine whether the attempt made to separate it in pure culture was positive. It is believed, however, that the organism has been separated, and steps are being taken to continue the culture into several generations.

Clegg's results were obtained with lepra bacilli obtained from persons who had died from the disease. The experiments at the leprosy investigation station, on the other hand, were conducted with cultures taken from early untreated cases. The successful cultivation of the leprosy bacillus by Clegg must be regarded as of far-reaching importance. In fact, it may be said that the first epoch of the scientific investigation of leprosy began with the discovery of the bacillus, and the second epoch now begins with its successful cultivation on artificial media.

(4) The leprosy investigation station is at present investigating a disease analogous to human leprosy, namely, rat leprosy. Previous

writers on this subject have noticed certain characteristic lesions in these rodents, some of which bore a strong resemblance to the pathology of human leprosy. The consensus of opinion, based chiefly upon the geographical distribution of the two diseases, is that rat and human leprosy are distinct entities, but that the organisms of the two are closely allied.

Owing to the fact that the laboratory staff had not been able to successfully inoculate animals with the bacillus of human leprosy, the existence of an analogous animal disease early attracted attention, as it was believed that data, obtained from the study of such a disease in rats might, by analogy, be an important addition to our knowledge of the similar disease in man; at least might point out some line of experiments in the human disease. For this reason, white rats were obtained in San Francisco, from Passed Asst. Surg. McCoy, who inoculated them with the bacillus of rat leprosy and forwarded them to the station in Hawaii. Some of these rodents have recently died of rat leprosy. The lesions which they presented were very much localized, presenting earlier types of the disease than have heretofore been described. It is believed that the study of these cases has shown certain facts, which may be a distinct addition to our knowledge of the problem of rat leprosy. These observations have also suggested the advisability of carrying on a similar line of investigations in the case of the human disease.

(5) A great number of experiments have been performed during this year by the assistant director at Kalihi, having for their object a method for the early diagnosis of leprosy. These tests were similar in nature to those employed in Wassermann's reaction. It was hoped that some means of diagnosis would thus be secured which would be so specific in nature as to exclude the possibility of all other diseases. After carrying on this work for a number of months, however, it was decided that there was no probability of the existence of a sufficiently specific reaction to make this method of diagnosis of practical value in leprosy.

(6) Upon the opening of the Kalawao hospital and the reception of patients there a bacterial vaccine was prepared from six different nonpathogenic acid-fast bacilli. This substance was administered, after proper animal tests, to two patients under the director's care. A slight local reaction occurred in these patients after the first injection, but it was not observed thereafter. There was never any general reaction, the patients hardly being conscious of having received a medicinal agent. This substance was given twice a week in increasing doses. After it had been received for about a month the two patients (both of them moderately advanced nodular lepers) noticed that some of their nodules were softening. Accurate account was kept of the condition of these nodules from this time forward. In one of the patients the nodules softened rapidly and discharged, leaving punched-out circular ulcers. Most of these ulcers remained without any signs of healing until later, when in the case of one of the patients a number of these ulcers rapidly healed over.

The general condition of these two patients improved slightly during treatment. The director believes that this treatment would be worthy of further trial were it not for the fact that it is expected to have at an early date a similar vaccine from the lepra bacillus. The fact, however, that these analogous organisms should have given such a marked and apparently favorable result stimulates the hope that with killed cultures of lepra bacilli even more decided results may be obtained.

Five of the patients at Kalihi, all of them relatively early cases, have since last December received large doses of chaulmoogra oil, together with daily inhalations of ozone. The dose of the oil was carried to the point of gastric intolerance, and the ozone was administered by inhalation until the patients experienced severe coughing. Four of these patients have shown decided improvement in their general condition, and this improvement has been accompanied by the disappearance of a number of the nodules. The condition of three of these cases can, however, be considered only as improved. In the case of one other patient the improvement has indeed been very marked. Former Assistant Director Brinckerhoff recently examined this patient, and being familiar with his condition for over a year was quite able to judge of the man's condition. After his examination he kindly reported to the director that he was unable to note any clinical manifestations of the disease, nor was he able to find lepra bacilli after a thorough search. He further reported that he believed this man to be cured and suggested that the case be brought to the attention of the board of health for examination preliminary to being released.

The improvement reported in the Kalihi patients simply bears out the observations of many investigators and clinicians, namely, that great benefit is sometimes noted in cases of early leprosy when given full doses of chaulmoogra oil. But the fact that this disease often relapses after long periods of quiescence must be borne in mind in judging the apparent results of treatment.

Two patients at Kalawao, both of them fairly advanced nodular types of the disease, were given a substance extracted from the acid-fast bacilli mentioned above and used in the nature of a vaccine, this substance being the fat like body to which the acid-fast property of these bacilli is due. Its extraction was effected by first treating the organism by a weak solution of ammonia, afterwards by cold ether and alcohol, then hot alcohol. The bulk thus extracted equaled about one-fourth of the total bulk of the dried bacteria employed. These two patients were given this substance hypodermatically twice a week in relatively large doses. The absence of favorable results from its use was as discouraging as was the previous experience in treating lepers with a somewhat similar substance, known as "Nastin-B."

Another patient was given the proprietary remedy known as "Antileprol" which, according to its discoverer, Engel-Bey, is a derivative of chaulmoogra oil. Favorable results in many cases were reported by this gentleman in a paper read at Bergen. The patient mentioned received this substance for about two months. There were no gastric disturbances during this time, but no improvement in his condition was noted.

(7) The work of indexing the literature on leprosy was continued and will probably require another year for its completion.

IMPROVEMENTS TO STATION.

During this year extensive improvements have been made at the Kalawao station. Roads have been constructed, land covered with brush has been cleared, the buildings of the station completely screened against insect invasion, animal cages constructed, the ground around the buildings graded, a compost pit for the disposition of stable manure and garbage constructed, a garden planted and cared for, etc. As a result of these improvements little or no expenditures will be required during the ensuing year for improving the station.

The laboratory equipment has been completed, and with the exception of a few articles required on account of breakage, very little equipment will be immediately needed.

The library is not so complete as it should be, but in work of this character a library is of use only when properly indexed. The indexing of the present library and the current issues alone will occupy most of the translator's time during the ensuing year, so it is not considered advisable to make many additions until the present volumes have been indexed.

INCREASED APPROPRIATIONS NECESSARY.

It was expected that with the completion of the station there would be no further interruption, and that full investigations could be carried on with all possible speed in the interest of science and those engaged in the work. This would cause greater expense than had hitherto been incurred. But the expenditures up until the opening of the hospital and laboratory at Kalawao were not an index of the ordinary expenses that had been anticipated and provided for by Congress. Unfortunately, however, they were made the basis of the estimates of appropriations for 1911. It therefore became necessary to curtail expenses, and this was done by great reduction of the work at Kalawao with the beginning of the fiscal year 1911. On account of the objects of the investigation, and its great importance to the public health not only of Hawaii but of other States and Territories, it is hoped that more liberal appropriations will be made as necessary, and that thereby the studies may eventually be brought to a successful termination and new research undertaken.

SCIENTIFIC REPORTS.

Several valuable contributions to the literature on leprosy have been made during the year. These have been published as Public Health Bulletins, and will be found under that caption.

Representation at Meetings of Scientific and Sanitary Associations.

During the year officers were detailed to the following meetings of scientific and sanitary associations in the United States and abroad:

International Commission for the Revision of the International Classification of Diseases and Causes of Death, Paris, July 1 to 3, 1909.

International Congress on Tuberculosis (Eighth), Stockholm, July 8 to 10, 1909.

International Congress on Alcoholism (Twelfth), London, July 18 to 24, 1909.

Medical Associations of Washington, Oregon, Idaho, and British Columbia (joint meeting), Seattle, Wash., July 20 to 23, 1909.

International Congress against Leprosy (Second), Bergen, August 16 to 19, 1909.

American Pharmaceutical Association, Los Angeles, Cal., August 16 to 21, 1909.

International Medical Congress (Twelfth), Budapest, August 29 to September 4, 1909.

Association of Military Surgeons, Washington, D. C., October 5 to 8, 1909.

Medical Society of Virginia, Roanoke, October 5 to 8, 1909.

Mississippi Valley Medical Association, St. Louis, Mo., October 12 to 14, 1909.

American Public Health Association, Richmond, Va., October 19 to 22, 1909.

National Conference on Pellagra, Columbia, S. C., November 3 and 4, 1909.

Conference of Sanitary Officers of the State of New York, Rochester, November 10 to 12, 1910.

Chicago Medical Society, Chicago, Ill., November 24, 1909.

New Jersey Sanitary Association, Lakewood, December 3 and 4, 1909.

Council of Pharmacy and Chemistry of the American Medical Association, Chicago, Ill., November 12 and 13, 1909.

International Sanitary Convention of American Republics (Fourth), San Jose, Costa Rica, December 25, 1909, to January 2, 1910.

American Association for the Advancement of Science and affiliated societies, Boston, Mass., December 27, 1909, to January 1, 1910.

Conference on Hookworm Disease, Atlanta, Ga., January 18 and 19, 1910.

Municipal Health Officers of Ohio, Columbus, January 20 and 21, 1910.

American Society of Inspectors of Plumbing and Sanitary Engineers, Trenton, N. J., January 20 to 22, 1910.

Medical Society of New York, Albany, January 25 and 26, 1910.

Board of Directors of the Virginia State Anti-Tuberculosis Association, Richmond, February 2, 1910.

Opening of a National Campaign on Oral Hygiene, Cleveland, Ohio, March 18, 1910.

Association of American Medical Colleges, Baltimore, Md., March 21 and 22, 1910.

Lake Michigan Water Commission, Milwaukee, Wis., April 1, 1910.

Conference Charities, Charlottesville, Va., April 5, 1910.

Conference of City, County, and State Health Officers, Nashville, Tenn., April 6 and 7, 1910.

Tennessee State Medical Association, Memphis, April 12 to 14, 1910.

California State Medical Society, Sacramento, April 18 to 21, 1910.

California Public Health Association, Sacramento, April 18 to 21, 1910.

Association for the Study and Prevention of Tuberculosis, Washington, D. C., May 2 and 3, 1910.

American Pharmaceutical Association, Richmond, Va., May 2 to 7, 1910.

International Association of Medical Museums, Washington, D. C., May 3 and 4, 1910.

Missouri Medical Association, Hannibal, May 3 to 5, 1910.

Southern California Medical Society, Redlands, May 4, 1910.

Ohio Medical Association, Cincinnati, May 5 to 7, 1910.

Texas State Medical Association, Dallas, May 10 to 12, 1910.

Oklahoma State Health Association, Tulsa, May 11, 1910.

National Conference on the Education of Dependent, Backward, Truant, and Delinquent Children, St. Louis, Mo., May 16 to 19, 1910.

Arkansas State Medical Society, Pine Bluff, May 19 to 21, 1910.

California State Pharmaceutical Association, San Francisco, May 17 to 20, 1910.

National Conference of Charities and Corrections, St. Louis, Mo., May 19 to 26, 1910.

Carolina Municipal Convention, Winston-Salem, N. C., June 2 and 3, 1910.

American Association of Medical Milk Commissions, St. Louis, Mo., June 6, 1910.

American Medical Association, St. Louis, Mo., June 7 to 10, 1910.

American Society of Tropical Medicine, St. Louis, Mo., June 11, 1910.

Medical Society of North Carolina, Wrightsville Beach, June 23, 1910.

Joint Meeting of Ohio State Board of Health with Local Boards of Health, Cleveland, June 30 and July 1, 1910.

Eighth Annual Conference of State and Territorial Health Authorities.

In accordance with the act of Congress approved July 1, 1902, the Eighth Annual Conference of State and Territorial Health Authorities, with the Public Health and Marine-Hospital Service, was held at the bureau April 30, 1910. Twenty-two States, two Territories, and the District of Columbia were represented by delegates.

The conference was called to order by the Surgeon General. In his opening remarks, he invited attention to the international sanitary convention held in Costa Rica in December, 1909, and outlined the objects and benefits to be derived from that convention. He read the resolutions adopted with respect to the sanitation of ports, and which, if enforced by the several republics, will result in the improvement of sanitation and consequent diminution of quarantine. Following these remarks, the work of the annual conference, as outlined in the proposed program, was taken up.

NATIONAL CARE OF LEPERS.

The committee on the national care of lepers, which was appointed during the seventh annual conference, was called upon for its report, and Dr. H. M. Bracken, chairman of the committee, referred to a resolution that had been adopted in a previous conference, emphasizing the necessity of such provision by the National Government for the care of persons afflicted with the disease. It was the consensus of opinion of the committee and the delegates in attendance that there should be established a national leper home for the maintenance and treatment of those cases in the various States and Territories in the continental United States for which no provision has been made by the States themselves.

PREVENTION OF RABIES.

The committee on the prevention of rabies, through Passed Asst. Surg. J. F. Anderson, chairman, presented a signed report on behalf of the committee. In this report reference was made to the economic importance of rabies and the necessity of means for its prevention. It was pointed out that the widespread prevalence of the disease gives rise to a large annual sacrifice of live stock representing many thousands of dollars. While the measures by which rabies can be eradicated, or at least reduced to a minimum, are well known, the committee was of the opinion that this would not be accomplished until the popular apathy with respect to the question was overcome, and that measures to be effective must be state wide in their application and based on uniform legislation. Reference was made to the success had in Great Britain and other countries through the application of well-known preventive measures.

Without indicating the exact form of regulations for prevention of the spread of rabies, the committee outlined those measures which have proven valuable, as well as their limitations and means of enforcement. It was recognized that the dog and his wild congeners are the principal disseminators of rabies, and it is to prevent the possibility of transmission by these animals that measures must be taken. Among those suggested were, first, the destruction of ownerless dogs; second, the licensing and tagging of dogs; third, the making of dog owners legally responsible for damage inflicted by those animals; fourth, the education of dog owners with respect to the care of dogs as affecting the spread of communicable diseases; fifth, the adoption and constant enforcement of muzzling ordinances; sixth, the compulsory confining of dogs by their owners on private premises in infected areas; seventh, the leading in leash of animals which, however, should be muzzled; eighth, the compulsory notification of cases of rabies or suspected cases of rabies among dogs or other animals; ninth, the enforcement of quarantine for a period of at least six months upon imported dogs to prevent the introduction of the disease from abroad; and tenth, the immunization of the lower animals against rabies. This latter suggestion, however, was not regarded as feasible except in isolated instances, and even then the opinion was expressed that such animals should be so cared for that no danger of infection would exist. Finally, it was the opinion of the committee that wholesale inoculation for the prevention of rabies was not feasible, and it was, therefore, not worthy of serious consideration. After some discussion the report was adopted as presented.

COMPILATION OF HEALTH LAWS.

The subject of the compilation of national, State, and Territorial health laws was then considered. The progress already made in this direction, as has been outlined on pages 43–45 of this report, was reported by Asst. Surg. Gen. J. W. Kerr, who briefly outlined the steps that had so far been taken. Further cooperation on the part of the several State and Territorial health authorities was earnestly solicited. The scope of the proposed compilation was discussed, and it was the opinion of the conference that the laws should be published by subject and, where practicable, references should be made to the court decisions under those laws.

COLLECTION OF MORBIDITY STATISTICS.

The subject of the collection of morbidity statistics had been selected for discussion by the conference on account of its importance, and because of the greater efforts being made to render such data more accurate and more immediately available. In a preliminary statement, the Surgeon General referred to the fundamental importance of morbidity statistics and the lack of complete reports. Among the reasons given by him for the present incompleteness of these statistics, he mentioned the uneven distribution of the population, the division of legislative responsibility, and the lack of uniformity of laws and the methods of their enforcement. He referred also to the law under which the Public Health and Marine-Hospital Service collects morbidity and mortality statistics and pointed out that the bureau is dependent upon State health authorities for such data. For this latter reason it was shown by him that there was necessity of uniform laws on the subject that would be capable of enforcement, thus developing and enlarging the "registration area for morbidity."

Dr. Ennion G. Williams, commissioner of health of Virginia, discussed the compilation of morbidity statistics by the Federal Government which would be of most service to State and Territorial health officers. Dr. Williams emphasized the duty of the Federal Government in supplying the State and Territorial health authorities with a knowledge of the diseases prevailing in adjacent States, and careful and systematic studies of morbidity statistics extending over a long period and over the entire country.

Dr. F. W. Shumway, secretary of the Michigan State Board of Health, outlined the best methods of securing reports of infectious diseases in a State, based on the experiences had in Michigan. He outlined the laxity of reporting cases of sickness, and the lack of cooperation and inaccuracy in this work, and expressed the opinion that there was only one available means by which the situation could be met, namely, education of the masses, and State control of local health officers. He emphasized the fact that public-health work is expert work, and that those engaged in it should be properly trained, should receive their appointments from the State, and adequate compensation for their services.

An analysis of the laws relating to morbidity statistics which had been collected was presented to the conference by Asst. Surg. Gen. J. W. Trask. By means of maps Dr. Trask showed those States in which smallpox, scarlet fever, diphtheria, and measles are reportable diseases, these four diseases being selected as constituting the diseases which would most likely be reported. He also briefly summarized the organization for the collection of morbidity statistics in certain States under their laws.

Dr. W. R. Batt, registrar of vital statistics of Pennsylvania, referred to the success attending the collection of morbidity statistics in that State, and attributed it to the liberality of appropriations, the appointment by the State of local health authorities, and the direct supervision maintained over cases of the communicable diseases.

A committee was appointed by the Surgeon General to consider and report on the question of the collection of morbidity statistics, the personnel of this committee being as follows: Dr. S. J. Crumbine, of Kansas; Dr. W. F. Snow, of California; Dr. Mark W. Richardson, of Massachusetts; Dr. W. F. Shumway, of Michigan; Dr. E. G. Williams, of Virginia; and Asst. Surg. Gen. J. W. Trask, of the Public Health and Marine-Hospital Service.

INTERSTATE TRANSPORTATION OF DEAD.

The disposal and transportation of the dead in interstate traffic was brought to the attention of the conference on account of the difficulties in transshipment of dead bodies from national quarantine stations to other sections of the country. Asst. Surg. Gen. L. E. Cofer presented official correspondence to show the obstacles surrounding the transportation of a body not dead of an infectious disease from Guatemala to France via New Orleans and New York. Dr. Kerr presented an analysis of the laws and regulations in the several States and Territories relating to the transportation and disposal of dead bodies, which was followed by an extended discussion and which emphasized the necessity of uniformity of legal restrictions relating to this subject.

The Director of the Hygienic Laboratory then made a brief report of experimental studies as to what should constitute an "approved disinfectant" for the disinfection and embalming of dead bodies.

With the view to considering the whole subject of the transportation of the dead in interstate traffic, a committee was appointed by the Surgeon General consisting of Asst. Surg. Gen. L. E. Cofer; Dr. H. M. Bracken, of Minnesota; Dr. W. R. Batt, of Pennsylvania; Dr. J. Y. Porter, of Florida; Dr. J. H. Townsend, of Connecticut; and Dr. G. H. Sumner, of Iowa.

After assuring the delegates of the desire of the bureau to cooperate with State and Territorial health authorities in the prevention of the spread of contagious and infectious diseases the Surgeon General declared the conference adjourned.

FOURTH INTERNATIONAL SANITARY CONVENTION OF THE AMERICAN REPUBLICS.

In accordance with a resolution adopted by the Second Internation Sanitary Convention of the American Republics, and an official call issued by the International Sanitary Bureau June 14, 1909, the Fourth International Sanitary Convention of the American Republics was held in San Jose, Costa Rica, December 25, 1909, to January 2, 1910.

The convention was formally opened with impressive ceremonies on Christmas Day in the National Theater. Among those in attendance were the President of the Republic of Costa Rica, Licentiado Don Cleto Gonzalez Viequez, his cabinet, and the chief justice of the supreme court; the president of the convention, and delegates from 12 American Republics, and a large number of influential citizens.

The following is a list of the delegates designated by their respective Governments to attend the convention:

Dr. Martin Amador, Colombia.
Dr. Hugo Roberts, Cuba.
Dr. Manuel Camilo Vial, Chile.
Dr. Alfonso Quinones M., El Salvador.
Dr. Walter Wyman, United States.
Dr. J. W. Amesse, United States.
Dr. R. H. von Ezdorf, United States.
Dr. H. M. Bracken, United States.
Dr. A. H. Doty, United States.
Dr. Rhett Goode, United States.
Dr. Eduardo Liceaga, United States of Mexico.
Dr. Jesus Monjaraz, United States of Mexico.
Dr. Nazario Toledo, Guatemala.
Dr. Fernando Vasquez, Honduras.
Dr. Belisario Porras, Panama.
Dr. Pablo Acosta Ortiz, Venezuela.
Dr. Luis Razetti, Venezuela.
Dr. Juan J. Ulloa, Costa Rica.
Dr. Carlos Duran, Costa Rica.
Dr. Jose Maria Soto A., Costa Rica.
Dr. Elias Rojas, Costa Rica.
Dr. Castro Cervantes, Nicaragua.

On account of unforeseen circumstances Drs. Bracken, Doty, and Goode were unable to be present and telegrams were received expressing their regret that matters of importance had prevented their attendance.

The President of Costa Rica opened the convention, and an address of welcome was made by the minister of foreign affairs, Don Ricardo Fernandez Guardia, to which responses were made by Dr. Juan J. Ulloa, president of the convention, and the senior members of each delegation.

Following the method of procedure established at previous conventions, the appointment of vice presidents was made, committees were named, and two secretaries for the convention were chosen.

The succeeding sessions which began December 27, 1909, and ended January 3, 1910, were held in the Hall of Congress. On December 27 credentials were submitted, and a report from each delegate was offered, these reports being limited to 15 minutes each, and bearing only on those subjects outlined in the provisional program which had emanated from the International Sanitary Bureau of Washington, as follows:

(1) Reports presented by different delegates in regard to the sanitary regulations and laws adopted, and in force, in their respective countries, since the last meeting.

(2) Special report by each official delegate regarding the manner in which the resolutions adopted in the three previous conventions have been put into practice, in their respective countries.

(3) Reports in regard to sanitary conditions in ports, and measures proposed for the improvement of such sanitary conditions (with special reference to the principal ports).

(4) Reports relating to the registration of the movement of population and the rate of mortality in each country, specifying those of ports and principal cities.

(5) Sanitation of cities and especially of ports.

(6) Measures for the protection of passengers who embark in vessels from infected ports.

(7) Discussion of measures against the introduction of diseases not included in the convention of Washington of 1905.

(8) Sanitary models or forms to be adopted by nations forming part of this convention.

(9) Discussion on sanitary measures relating to yellow fever, bubonic plague, tuberculosis, malaria, and other diseases, in conformity to new discoveries or experiences.

(10) Discussion on measures relating to venereal diseases.

(11) Discussion on the necessity of the adoption, by the European nations, of the convention of Washington and other sanitary measures subsequently adopted by this convention with respect to such colonies as they have in America.

(12) Discussion on new discoveries with respect to the transmission of yellow fever and malaria, besides the mosquito bite.

(13) Organization in each country represented at this convention, of a commission of three physicians or health officers to act as delegates of the International Sanitary Bureaus of Washington or Montevideo, and to form part of the international sanitary information committee of the American Republics.

The presentation of the various reports occupied both sessions of December 27 and the morning session of December 28. The delegates reported active progress with regard to sanitation in their respective countries, and manifested great interest in the matters under discussion before the convention.

The afternoon session of December 28 was devoted to consideration of sanitation of seaports, and resolutions were presented outlining sanitary ordinances for the protection of such cities.

The first session of December 29 was devoted to a review of vital statistics in the countries represented and a discussion of the methods to be adopted against yellow fever and malaria. At the afternoon session measures against the spread of plague, tuberculosis, beriberi, and trachoma were discussed in detail.

On December 30 the sanitation of cities and ports was given further consideration, and in the afternoon session the measures for the protection of passengers embarking from infected ports was discussed.

On December 31 an early session was devoted to comparison of various models of sanitary documents used by the various republics, and in the elaboration of model bills of health which will better serve the purpose.

On January 1 the delegates to the convention paid their respects to the President of Costa Rica and his official family.

The closing session was held January 3, 1910, with impressive ceremonies similar to those that marked the inaugural. Santiago de Chile was chosen as the place of meeting of the Fifth International Sanitary Convention, and Dr. Cienfuegos, president of the superior board of hygiene of Chile, was elected president.

The officers elected for the International Sanitary Bureau at Washington were as follows:

President: Surg. Gen. Walter Wyman, Public Health and Marine-Hospital Service.

Secretary: Dr. Juan J. Ulloa, Costa Rica.

Members: Dr. Eduardo Liceaga, Mexico; Dr. Pablo Acosta Ortiz, Venezuela; Dr. Rhett Goode, United States; Dr. Juan Guiteras, Cuba; and Dr. Manuel Camilo Vial, Chile.

In accordance with that part of the program providing for the organization in each country represented at the convention of a commission of three physicians or health officers, to act as delegates of the International Sanitary Bureaus of Washington or Montevideo, and to form part of the international sanitary information committee of the American Republics, the personnel of the commissions in question were announced as follows:

Columbia: Dr. J. M. Lombana Barreneche, Dr. Ricardo Amaya Arias, and Dr. Juan David Hercera.

Chile: Dr. Ricardo Davila Boza, Dr. Julio Cordova, and Dr. Pedro Lautan Ferrer.

Costa Rica: Dr. Carlos Duran, Dr. Elias Rojas, and Dr. Jose Maria Soto A.

Cuba: Dr. Juan Guiteras, Dr. Enrique B. Barnet, and Dr. Aristides Agramonte.

Guatemala: Dr. Salvador Ortega, Dr. Juan J. Ortega, and Dr. Jose Azurdia.

Honduras: Dr. Jose M. Ochoa Velasquez, Dr. Ignacio Castro, and Dr. Juan Angel Arias.

Mexico: Dr. Eduardo Liceaga, Dr. Jesus Monjarraz, and Dr. Nicolas Ramirez de Arellano.

Nicaragua: Dr. Luis H. Debaylo, Dr. Rodolfo Espinoza, and Dr. Juan B. Sacaza.

Panama: Dr. Ciro Luis Urriola, Dr. Alfonso Preciado, and Dr. Augusto S. Boyd.

Salvador: Dr. Tomas G. Palomo, Dr. Francisco Guevara, and Dr. Rafael V. Castro.

United States of America: Dr. A. H. Glennan, Dr. J. W. Kerr, and Dr. John W. Trask.

Venezuela: Dr. Pablo Acosta Ortiz, Dr. Carlos Manuel Cabado, and Dr. Luis Razetti.

As a result of its deliberations, there were formulated a number of resolutions, which, when finally edited by the executive committee, were adopted by the convention, as follows:

RESOLUTIONS ADOPTED.

I.

With respect to bilharziosis, hydrophobia, leprosy, typhus fever, ankylostomiasis, and similar diseases, this convention suggests that recommendations be limited to requesting the various governments to take those measures of protection which they believe sufficient.

II.

(*a*) To recommend especially to the various governments to employ all possible means at their disposal to secure the effective sanitation of seaports, to the end that the introduction of plague, cholera, and yellow fever may be prevented, and in the event a case of either of these diseases reaches a port, that it be promptly isolated.

(*b*) To recommend special ordinances for the proper construction of rat-proof buildings, especially those designed for the storage of foodstuffs, such as markets, granaries, abattoirs, stables, etc.

(*c*) To make obligatory the use of galvanized-iron garbage cans with tight-fitting covers, and to arrange for the daily disposal of garbage.

(*d*) That properly equipped laboratories be provided for all seaports, where the periodical examination of rats shall be made, so that plague can be apprehended before its appearance in human beings.

(*e*) That the crusade against the mosquitoes, stegomyia and anopheles, be carried on coincidentally along lines which have been shown to bring the best results.

III.

(*a*) That careful statistics on population, morbidity, and mortality be kept at every port compiling such data at regular intervals of not more than one month, and also in the form of annual reports.

(*b*) To provide at every port a proper system of sewerage, an adequate supply of pure water, and arrange for the paving of streets.

(*c*) That all habitations be constructed with a view to furnishing fresh air and sunlight sufficient to maintain the health and vigor of the inmates, and that the character of the construction shall conform to local conditions.

(*d*) That in every port there shall be a sanitary authority clothed with ample power to vigorously enforce sanitary ordinances.

(*e*) That it be made obligatory in schools to furnish instruction in the elementary principles of hygiene and sanitation. This instruction should be objective, or through means of publication of simple rules, or both.

IV.

(*a*) Captains and owners of vessels of all classes shall take measures to free their ships from rats and to use all possible means to keep them clean.

(*b*) That to obtain the above result periodical fumigations of the holds with sulphur gas should be requested, this period not to exceed three to six months, choosing such time as when the vessel is free of cargo or undergoing renovation.

V.

(*a*) That no person be allowed to embark who is afflicted with quarantinable disease, such as scarlet fever, measles, diphtheria, or any other transmissible affection.

(*b*) To permit the embarkation of passengers and crew who may have been exposed to contagion where the above diseases exist, provided that there be observed at the port of embarkation the following precautions:

(1) *Cholera.*—Five days' observation or surveillance; disinfection of baggage.

(2) *Smallpox in epidemic form.*—Vaccination or evidence of immunity to smallpox.

(3) *Typhus fever in epidemic form.*—Twelve days' detention or observation; disinfection of baggage.

(4) *Plague.*—Seven days' detention or surveillance; disinfection of baggage.

(5) *Yellow fever.*—Six days' detention or surveillance where immunity can not be shown.

(*c*) Thorough cleaning of all portions of the vessel and prompt isolation of persons falling ill aboard.

VI.

(*a*) Your executive committee recommends that Article IX of the convention of Washington be interpreted as follows:

(ARTICLE IX.) In order that a locality be considered free of contagion it will be necessary to furnish official proof to the satisfaction of the interested party:

First. That there have been no deaths nor new cases of plague or cholera for five days, either after the isolation, death, or the discharge of the last case of plague or cholera; in the case of yellow fever the period will be 18 days, but the various governments reserve the right to prolong this period against those nations where the measures for the isolation of cases, the destruction of mosquitoes, and the disinfection of foci are not observed.

Second. That all measures of disinfection have been applied and in treating of plague cases, that there have been executed all means for the destruction of rats. In the case of yellow fever, that proper measures have been taken against the mosquito.

VII.

Recommend to the study of the Fifth Sanitary Conference what criteria should be considered by sanitary authorities to class an individual as immune to yellow fever.

VIII.

To recommend to the Governments here represented the great importance of spreading in all possible ways knowledge of the methods by which the people may protect themselves against malaria and tuberculosis, requesting especially the publication of rules for the control of these diseases and making it obligatory on the part of the employers of labor to supply such rules.

IX.

That the countries here represented adopt the models of sanitary documents herewith presented.

X.

To recommend to the Governments represented, for future sanitary conferences, there be nominated delegates who have assisted in previous conferences, and when the delegations are composed of more than one member, that one shall have assisted at a previous conference, or that in any case the delegates shall be sanitary authorities in their respective countries.

XI.

To request of the bureau of information of Montevideo to forward a report to the International Sanitary Bureau at Washington of its transactions since the Third International Sanitary Conference.

XII.

With the object of perfecting the knowledge of infectious diseases in the Tropics and to give to tropical medicine the real scientific basis now held in the most advanced nations, this conference requests of the Governments of the American Republics that whenever these elements of progress are not found to encourage every project tending to provide special information in parasitology and in pathological anatomy.

XIII.

To request also of the above-named Governments the establishment of laboratories, where not only diagnoses may be made in compliance with the resolutions of our sanitary conventions, but where also original investigations in tropical and general pathology, along lines which the sanitary authorities deem convenient.

The number and purport of the resolutions adopted are a fair index of the importance of the convention. On the whole, it has contributed to a better understanding of health conditions of the respective republics, and will further the international sanitary policies inaugurated at previous conventions.

The holding of the Fourth International Sanitary Convention at San Jose, Costa Rica, was a most happy event both on account of its geographical position and because of the beneficent influence that will be felt by the neighboring republics.

The delegates of the convention were made the guests of the nation during their stay in San Jose, two buildings having been set aside for their accommodation. They were entertained at dinner by the President of the Republic, and a reception was tendered them by the minister of foreign affairs. In addition, other entertainments were provided, including visits to hospitals and other eleemosynary institutions having more or less direct influence on public health.

MARITIME QUARANTINE.

DUTIES IN RELATION TO FEDERAL QUARANTINE.

Supervision has been maintained over the enforcement of the national quarantine laws, and regulations relating thereto have been prepared and promulgated. The operations of the 44 Federal quarantine stations in the United States and those in the Philippines, Hawaii, and Porto Rico, have been conducted, and medical officers have been detailed to serve in the offices of the American consuls at foreign ports, as provided by the act of February 15, 1893, for the prevention of the introduction of contagious and infectious diseases into the United States, its possessions, and dependencies.

Supervision has been maintained over the care and preservation of the buildings, wharves, and machinery of the shore quarantine stations, and all floating property used at such stations. A book of instructions is provided for guidance in the care and preservation of quarantine steamers and in boat ceremony and discipline.

From the reports of service officers and American consular officers at foreign ports, the bureau is kept informed of the sanitary conditions and existence of epidemic diseases at the various ports, both domestic and foreign. It is thus possible to outline a policy to be observed at the various quarantine stations, and to institute timely precautionary measures against the spread of quarantinable diseases.

GENERAL REVIEW OF THE QUARANTINE WORK DURING THE FISCAL YEAR.

In administering quarantine as provided by regulations, the medical officers of the service have inspected a total of 16,766 vessels at the domestic and insular quarantine stations, and at foreign ports. Of this number 1,603 were fumigated or disinfected either on account of actual infection existing on board or for the destruction of disease carriers, such as rats and mosquitoes. This involved the inspection of 1,433,134 passengers and crew for the purpose of determining whether they were infected with any of the diseases quarantinable under the Treasury regulations.

Other measures instituted by the bureau, looking to a correlation of the energies of the maritime and quarantine interests in public-health matters, have greatly augmented the volume of quarantine work and its protective value to the public. These are, first, a revision of the quarantine regulations; second, the upbuilding of a public sentiment for the destruction of rats on vessels; and third, special measures taken against the introduction of cholera from Russia and Italy.

REVISION OF THE QUARANTINE REGULATIONS.

The bureau had been considering for some time past the advisability of revising the quarantine regulations, with the combined purpose of bringing them apace with the advance in scientific knowledge, insuring their conformity with the treaties of the international sanitary conference of Paris and of the American Republics, respectively, and finally affording to the public the maximum of protection with the minimum of restriction to commerce.

Accordingly, on February 21, 1910, a board was convened at the bureau for this purpose. The personnel of the board consisted of Asst. Surg. Gen. L. E. Cofer, chairman; Surg. H. R. Carter, and Passed Asst. Surg. R. H. von Ezdorf, recorder.

During the sittings of the board the Director of the Hygienic Laboratory and several officers of the service were called in consultation.

The revised regulations, after they were submitted by the board, received careful consideration by the bureau. It was deemed necessary to refer one paragraph (105) to the department for the opinion of the Solicitor of the Treasury as to whether, by its terms, the treaty of the international sanitary conference of the American Republics was being violated. The opinion of the solicitor, dated August 11, 1910, is as follows:

> By reference of Assistant Secretary Hilles, I am in receipt of a letter addressed to the Secretary of the Treasury on the 8th instant by Walter Wyman, the Surgeon General of the Public Health and Marine-Hospital Service, who desires to be advised whether under the provisions of article 48 of the Second International Sanitary Conference, paragraph 105 of the Quarantine Regulations now under revision would be permissible as proposed.
>
> The said article (which is also article 48 of the Third International Sanitary Convention, held in the City of Mexico in 1907) provides as follows:
>
> "Ships indemne from yellow fever, coming from an infected port after the medical visit (inspection), shall be admitted to free pratique, provided the duration of the trip has exceeded six days.
>
> "If the trip be shorter, the ship shall be considered as suspected until the completion of a period of six days, dating from the day of departure.
>
> "If a case of yellow fever develops during the period of observation, the ship shall be considered as infected."
>
> The proposed paragraph (105) of the Quarantine Regulations is as follows:
>
> "A vessel which, although coming from an infected or suspected port, has had neither death nor case of yellow fever on board, either before departure, during the voyage, or at the time of arrival, and which has not lain in such proximity to the shore as to render it liable, in the opinion of the sanitary authority, to the access of stegomyia mosquitoes, or which has been fumigated under the supervision of an accredited medical officer of the United States immediately before sailing, may upon arrival at the port of destination in the United States, with good sanitary history and in good condition, be subjected to the following treatment:
>
> "(*a*) If arriving in six days or less she may be admitted to pratique, with or without fumigation, in the discretion of the quarantine officer, and without further detention that is necessary to complete six days.
>
> "(*b*) If arriving after 6 days and within 12 days she may be immediately fumigated and admitted without detention.
>
> "(*c*) If arriving after a longer voyage than 12 days she shall be treated as required by paragraph 103 (*a*), (*c*), and (*f*).[1]
>
> "It may have aboard uninfected stegomyia, bred aboard or carried aboard from some previous port, and persons in the incubative period of yellow fever.

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[1] A vessel in this class is one aboard which there are no infected stegomyia, and no persons infective to stegomyia; that is, sick of yellow fever.

"If a case of yellow fever develops and infects the stegomyia aboard, the stegomyia must be destroyed before granting pratique, but as such stegomyia have not been found capable of conveying yellow fever until 12 days have elapsed after biting one sick of yellow fever the personnel of the vessel are not exposed to infection up to this time, and can be landed with safety prior to this time. Twelve days is the minimum time observed, one case only, for the incubation in the mosquito—the extrinsic incubation of yellow fever.

"If the vessel should have been in transt for a considerable number of days it is obvious that a case of yellow fever may have occurred and recovered, leaving the vessel infected, and not affording any opportunity to the quarantine officer to determine same."

Paragraph 107 of the regulations of April 1, 1903, reads as follows:

"If the vessel has in all respects complied with the quarantine regulations to be observed at foreign ports in such cases, and has been disinfected under the supervision of an accredited medical officer of the United States at the port of departure, she may upon arrival at her port of destination in the United States, with good sanitary history and in good condition, be subject to the following treatment:

"(*a*) If arriving in five days or less she may be admitted to pratique without disinfection or further detention than is necessary to complete the five days.

"(*b*) If arriving after 5 days and within 10 days she may be immediately fumigated and admitted without detention.

"(*c*) If arriving after a longer voyage than 10 days she shall be treated as if she had not been subjected to any previous treatment."[1]

These paragraphs substantially agree in principle, the former being more elaborate in detail with the same purpose in view.

The Surgeon General states that subdivision (*a*) of paragraph 105 does not disagree to any great extent with article 48; and that subdivision (*b*) disagrees with the said article only in the requirement of fumigation in the case of a vessel arriving after 6 days and within 12 days. I do not consider these details of objectionable or serious discrepancy.

A more important variation or disagreement is subdivision (*c*) which requires that when vessels arrive after a longer voyage than 12 days they shall be treated as required by paragraph 103, subdivisions (*a*), (*c*), and (*f*). This proposed paragraph is as follows.

"A vessel aboard which a case of yellow fever has occurred at any time during the voyage shall be treated as follows:

"(*a*) Careful visual and thermometer inspection of all persons.

"(*c*) Every person shall be disembarked, if possible, and subjected to an observation of six days, dating from the date of last possible exposure.

"(*f*) The ship shall be fumigated for the destruction of mosquitoes before the discharge of cargo, if possible. If the fumigation be not possible before the discharge of the cargo the discharged cargo should be under the supervision of the quarantine officer, and may be permitted as follows: By—

"First, the employment of immune persons for discharging the cargo; or

"Second, if nonimmunes be employed they shall be kept under observation during the discharge of the cargo and for six days from the last exposure on board."

Article 48 contemplates that the vessels classed therein as "indemne" can not have mosquitoes on board, for the reason that they have lain at such a distance from the shore as to render them secure from the access of mosquitoes from the land. It appears that no provision has been made with regard to mosquitoes which may be already on the vessel and possibly brought from some other infected port. In other words, as the Surgeon General says, "vessels even when lying offshore as described above may have stegomyia mosquitoes. In the past," he continues, "yellow fever has been transmitted in vessels arriving after a longer voyage than 12 days, under which circumstances a case of yellow fever might have occurred and recovered, and the mosquitoes on board first becoming infected and after 12 days becoming infective. Therefore a vessel might be extremely dangerous without presenting any tangible basis on which a quarantine officer could treat the vessel, unless a provision such as subdivision (*c*) of the revised regulations be made."

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[1] If the vessel should have been in transit for a considerable number of days it is obvious that a case of yellow fever may have occurred and recovered, leaving the vessel infected, and not affording any opportunity to the quarantine officer to determine same.

It appears that vessels of this class have, heretofore, been treated as suspicious—paragraph 107 (*c*)—or as presenting bad hygienic conditions.

The proposed precaution would seem to be in harmony with the main purpose of the sanitary conference.

Article 30 of the conference (or convention) reads as follows:

"Special measures may be prescribed in regard to crowded ships, notably emigrant ships, or any other ship presenting bad hygienic conditions."

The Surgeon General suggests that—

"Under this article there is apparently provision for special measures for the treatment of ships presenting bad hygienic conditions. Therefore, with special reference to the above-quoted article 30, the bureau desires the opinion of the solicitor as to whether under the terms thereof it would not be justifiable to incorporate in the regulations now being revised, subdivision (*b*) and subdivision (*c*) of paragraph 105. The additional reasons for so doing being the fact, as stated above, the paragraph 107 of the regulations now in vogue differs in a small degree from the proposed paragraph 105, and also that the bureau has never used the word 'indemne' in its classification of ships, which classification is used in article 48 of the international sanitary conference."

Construction of treaties is a matter of law, to be governed by the same rules, mutatis, mutandis, as prevail in the construction of contracts and statutes. (*Marryat* v. *Wilson*, 1 B. & P., 436; *Tucker* v. *Alexandroff*, 183 U. S., 424; Wools Int. S., 185.)

As a general proposition treaties and conventions should be liberally construed so as to carry out the apparent intention of the parties (*De Geofroy* v. *Riggs*, 133 U. S., p. 258), especially when the object is for mutual protection against infectious diseases. (See also 100 U. S., 483; Inter. Law Dig., sec. 133.)

The declared object of international sanitary conferences is for the purpose of studying and adopting measures of prevention in the countries of this Western Hemisphere against the propagation of infectious diseases through littorals and frontiers and for the encouragement of sanitation in each country interested in the vital subject.

For obvious reasons article 30, above quoted, gives a liberal margin for administrative discretion in prescribing the most effective measures for the prevention and spread of infectious diseases. And it may be said in this connection that, whenever a power or discretion is given by statute or treaty, everything necessary to make it effectual, everything essential to the exercise of it, is given by implication. (End. on Inter. Stat., sec. 418, and citations.)

I am therefore of the opinion, and do not hesitate to advise you, that the Bureau of Public Health and Marine-Hospital Service may lawfully incorporate in the regulations now being revised subdivision (*b*) and subdivision (*c*) of paragraph 105, as proposed.

CHANGES IN QUARANTINE REGULATIONS.

Some of the most important changes in the regulations are as follows:

1. The original and supplemental bill of health forms have been added to in several particulars, among which are provisions of the last sanitary conference of the American Republics for entry as to the distance from shore maintained and sanitary precautions adopted by vessels in foreign ports, and for entry as to the number of deaths from malaria.

2. The special regulations to be observed at foreign ports are placed under separate headings for each quarantinable disease. This not only renders them easy of interpretation, but, by the phraseology adopted, more discretion is allowed the consular or service medical officer in the determination of what is necessary to the certification of a vessel, its passengers, crew, and cargo. For example: Under the old regulations certain kinds of cargo were denied shipment from a plague-infected port unless first disinfected. Under the new regulations such articles are simply required to be free from vermin prior to shipment, the fact of the articles having been kept

free or rendered free from vermin being a detail left to the discretion of the consular or medical officer.

The policy outlined in the above instance, namely, the encouragement of precautions in foreign ports as contributory to, if not determinative of, the minimum of restrictive quarantine measures at the United States ports, characterizes the new regulations throughout.

3. A new zone has been created which is supplemental to that area heretofore designated as being south of the southern boundary of Maryland. The new zone lies between the southern boundaries of Maryland and Virginia, respectively, and has a close quarantine season which does not begin until May 15 and ends on October 1.

4. The incubative period of yellow fever has been changed from five to six days to conform to the international sanitary conference.

5. The regulations governing the treatment of vessels at United States ports in the case of plague, cholera, and yellow fever have been rewritten to conform to the international sanitary conference.

6. A paragraph has been added providing for the extermination of rats every six months on vessels engaged in trade from ports infected with plague.

7. The chapter on disinfectants has been revised and simplified to bring it apace with all the modern methods adopted in disinfecting.

Destruction of Rats on Vessels.

During the year the bureau has lost no opportunity of exploiting and developing its plan for creating a universal sentiment in favor of the destruction of rats on vessels.

The annual reports of 1908 and 1909 contain several references to this important project. The subject has been discussed with several leading steamship officials, and there are evidences of a growing willingness on the part of the shipping interests to cooperate with the bureau.

The reports from the various quarantine stations of the service show an increase in the work of fumigating vessels, primarily for the destruction of rats and other vermin.

Pursuant to the report (p. 174 of the annual report for 1909) of the methods employed in Chinese and Japanese ports by service officers, for the prevention and destruction of rats on vessels destined to United States ports, it was decided to make a similar investigation of the ports on the west coast of South America, with a view of establishing a further protection by rat destruction on the vessels plying between those ports and the north Pacific and Pacific island ports of the United States. Accordingly Surg. Rupert Blue, an experienced officer of the service, was directed to visit Valparaiso, Chile; Callao, Peru; and other ports to the northward for the purpose of conferring with the various American consular officers relative to the work above outlined.

VISIT OF SURGEON BLUE TO PERU AND CHILE.

The following extracts are taken from Surg. Blue's report:

> The Toyo Kisen Kaisha (Japanese) operates one vessel every six weeks between Valparaiso and Hongkong, via Iquique, Callao, Salina Cruz, Manzanillo, Honolulu, Yokohama, and Moji. Loading is done by means of lighters, except

at Callao, where occasionally some cargo is taken from a wharf. On the southward trip each vessel receives a partial fumigation at Callao by a service officer at the instance of the Peruvian Government. On the northward voyage the quarters of the crew, together with the empty holds (if any), are fumigated by the same officer. Compartments containing nitrate are not treated at Callao. The baggage of steerage passengers bound north is invariably disinfected by means of steam and formaldehyde gas.

Having discharged all cargo at Valparaiso, the vessels are sent to Coronel, a port 350 miles south of this place, for coal. These vessels are empty at Valparaiso and at Coronel. The equipment does not include a Clayton apparatus.

The Merchants' Line, plying between Guayaquil, Paita, Callao, Arica, Valparaiso, and New York, touching at Montevideo for coal, has one vessel every three weeks from Valparaiso. These vessels contain a little nitrate or copper ore on the southward-bound trip at Valparaiso. The agents state that the vessels of this line are fumigated at Ilo, Callao, and Paita on each trip. They carry the Clayton apparatus.

The Northern Pacific Line operates from Iquique or Antofagasta (occasionally from Valparaiso) to Puget Sound. This line has one sailing per month for San Francisco and Puget Sound, via Iquique, Callao, and Salaverry (for sugar). When bound south these vessels are fumigated at Paita and Arica, being empty at the latter place. On the northern trip a partial fumigation is done at Callao by the service officer. Lumber is unloaded at a wharf in Callao; at all other ports in South America the cargo is lightered. These vessels have no Clayton apparatus.

The West Coast Line of Chartered Steamships (cargo only), from Paita, Peru, to New York, operates one vessel per month between Paita and New York or ports in the Southern States, such as Charleston, Savannah, or New Orleans. The vessels are empty at both Paita and Arica. On the northward trip they are fumigated at Ilo, Peru, and when southward bound, at Callao, Peru, and at Arica, Chile. The fumigation at Callao is performed by the service officer for the Peruvian Government. There is no Clayton furnace on any of these ships.

The Kosmos Line (German) operates one vessel every two months between Valparaiso, San Francisco, and Puget Sound points. The itinerary, northward bound, includes the ports of Antofagasta, Iquique, Arica, Callao, Guayaquil, Central America, and Mexico. On the return voyage, Panama is included with the above. Between Guayaquil and Valparaiso, it is claimed, the vessels are fumigated four times. In addition, the vessels calling at Callao and San Francisco are fumigated at least once in six months at Hamburg, Germany. The agent believes the work performed at Peruvian and Chilean ports to be inefficient and without result. These vessels are practically empty at Valparaiso on the homeward voyage. Partial fumigations are given by the American consuls at Antofagasta and Iquique, going north, of such holds as may be empty at these places. Such work is verified on arrival at Callao by Acting Asst. Surg. Guitterez, who, on going aboard, demands the certificates of fumigation given at the above-mentioned places. In the absence of these, the empty holds are treated. These are only partial fumigations, however, and may not rid the ship of rats. The general cargo compartments are also fumigated at Callao.

Compañia Sud-Americana de Vapores (Chilean) advertises two departures per month from Valparaiso to the Isthmus. These touch at Coquimbo, Antofagasta, Iquique, Mollendo, Callao, Salaverry, Pascasmayo, Eten, and Paita, and connect at Panama with vessels bound for San Francisco, New Orleans, and New York. As many as four fumigations are received during the trip, one of which is given by the service officer at Callao. These vessels have been equipped with the Clayton apparatus, so that SO_2 may be generated and pumped into the compartments at any time during the voyage. Cargoes are taken by means of lighters, except at Valparaiso, Callao, and Panama, at which places the wharves are used.

The Pacific Steam Navigation Co. (British) dispatches six vessels monthly for Callao and intermediate ports. Two of these are fast mail steamers, and go through to Panama, calling at Coquimbo, Antofagasta, Iquique, Mollendo, Callao, Salaverry, and Paita en route. The service of the other boats is not so rapid, as frequent stops are made at small ports. Wharves are utilized at Valparaiso, Callao (except for mail steamers), and Panama for loading and discharging cargo. The equipment includes the Clayton furnace. The vessels are fumigated going and coming by both the Peruvian and Chilean authorities as many as six and eight times in three months.

Dr. Blue concludes that a great deal of unnecessary and inefficient work had been done in the ports north of Valparaiso. The impression was gained in interviews with managers that many of them would welcome any plan that would lessen the expense and avoid the delays encountered.

No objections were made to the plan of fumigating vessels to kill rats. At Valparaiso, on the contrary, the managers of two lines stated that they were satisfied with the proposed arrangements and would lend their aid to further their success.

Health conditions at Valparaiso.—Dr. Blue states, regarding the health conditions of Valparaiso:

> Its death rate in 1909 was about 35 per 1,000 inhabitants, while the rate in Buenos Aires was 16 per 1,000. This high mortality occurs chiefly among infants from 6 months to 6 years of age, and is due, for the most part, to poor food and bad housing. Tuberculosis was responsible for a large percentage of the deaths.
>
> There is no properly constituted board of health and no reliable certification of deaths. Under certain conditions laymen are authorized to sign death certificates. Vital statistics are collected by two distinct bodies, which, as a rule, do not cooperate or exchange important data. The asistencia publica, which performs some of the functions of a board of health, is not properly supported and is always in need of funds and sympathetic encouragement.
>
> In 1905 a severe epidemic of smallpox swept the State of Valparaiso from north to south and from the Andes to the sea. Competent authorities estimated the loss of life during the epidemic at 10,000 or more. Vaccination has received municipal attention in the past three years, and it is doubtful if a serious outbreak of a similar nature will occur in the near future. At this time there is one case of smallpox in the lazaretto.
>
> In the same year 40 cases of typhus fever (*Tifo exanthematica*) were reported.
>
> Typhoid fever prevails to a considerable extent in the province. From figures collected by the director of the Assistencia Publica, it has been shown that 229 deaths occurred in 1909 from this cause alone.
>
> The view is firmly maintained in Valparaiso that malarial fever does not exist south of Arica. During the war with Peru (1879–80) soldiers suffering with the disease were brought to Santiago, but owing to the absence of the Anopheline mosquitoes the infection was not transmitted to others.
>
> Hookworm disease and pellagra have not been observed as yet in Valparaiso.
>
> Bubonic plague appeared for the first time in 1903, and is supposed to have been introduced from one of the northern ports of Chile. Since then cases have been discovered in Santiago, but so far none have been reported in the ports south of Valparaiso. The last case was recorded in October, 1909. No serious outbreak has as yet occurred in this part of the Republic.
>
> Notwithstanding the ample warning furnished by the occurrence of cases of plague in the city, no measures have been instituted for the destruction of rats. The city is confronted by seemingly insurmountable difficulties. There are no funds, and the existing authorities have not the power to enact or enforce ordinances which would tend to lessen the dangers of a further spread of the disease. The large rat population has not been attacked, and there is no public sentiment to support operations against epidemic disease of any nature.
>
> The population is estimated at from 150,000 to 175,000 native Chileans. Stone, brick, and cement are the materials used in building, and there are but few wooden structures. The exports include flour, hay, grain, hides, wines, fruits, vegetables, cattle, and copper ore.
>
> *Public health administration in Chile.*—The central authority is the Consejo Superior de Higiene of Santiago, which exercises only an advisory function in the Republic.

The Consejo Departmental de Higiene, a body similar in some respects to a State health board, does not possess jurisdiction over municipal authorities, however, and is in evidence only in time of epidemics.

Every town of any importance has an organization known as the "Assistencia Publica," which corresponds to the municipal board of health of the States. The resemblance is not close, however, for the duties of a health board are divided between it and another body known as the "Junta Beneficencia." In the larger towns there is a "Director de Sanidad," or health officer, and in the seaports an additional medical officer, who has charge of maritime sanitation.

Surgeon Blue's itinerary from Valparaiso to Callao, Peru, included brief stops at Coquimbo, Antofagasta, Iquique, and Mollendo. Concerning the conditions at these points he states, in part, as follows:

The coast of Chile from Coquimbo to Arica, a distance of 700 miles, is an arid waste. In fact, between Coquimbo and northern Peru there is very little rainfall below the snow line of the Andes. No rain has fallen at Antofagasta or Iquique for seven years.

The nitrate and other mining industries support a number of towns in this region, namely, Caldera, Duasco, Taltal, Antofagasta, Tocopilla, Iquique, Pisagua, and Arica. In addition, there are railroads extending into Bolivia from Antofagasta and Mollendo which serve as outlets for the more-favored lands of the interior. A third road is being constructed at Arica. There is not a sheltered harbor nor a freight wharf at any of the ports named.

Water is obtained from small creeks, which take their origin in the cordilleras and descend in the direction of the coast, and the water is conveyed over the intervening distances in cast-iron pipes. The pipe-line at Iquique extends 90 miles inland.

Notwithstanding the fact that the source of the water is one of undoubted purity, typhoid fever is very prevalent throughout this arid region. The other elements of transmission, such as contact and flies, probably play the major rôle in spreading the disease. Mosquitoes of the domestic varieties are fairly numerous. One is at a loss to account for their presence in a formerly waterless country. They were doubtless imported in bunches of bananas, and have adapted themselves to the environment, breeding in tanks, barrels, and other neglected containers.

As regards plague, it would be wise, in the absence of information to the contrary, to declare the entire coast of Chile infected.

It is claimed, however, by the consular agent that Coquimbo is now free of infection. In view of the unrestricted commerce on the coast and the difficulties attending scientific diagnosis of the disease in a small town, it would not be safe to depend on this statement.

The origin of plague in Chile and Peru.—Surgeon Blue, in this same report, states that there is nothing definitely known as to the original source of the infection. Of the several theories offered the most plausible is the one which places the blame upon an unrestricted commercial intercourse with India during the early days of the present pandemic. Plague was endemic in Iquique as early as 1900, though it was not recognized or reported as such until a year or two later. In the New World the ports infected at that time were Santos, San Francisco, and probably Rio Janeiro. Was infection received from any of the above-named ports?

An examination of the oversea relations of Iquique will shed some light upon the problem. If such an investigation be made, it will be found that regular importations of gunny were received from Calcutta in 1900, and that owing to the large quantities required in packing nitrate these shipments were made direct in chartered bottoms. Several steamship lines, among which may be mentioned the Kosmos and the Pacific Steam Navigation Co., connected the Chilean coast with the infected ports of Santos and Rio. The intercourse with San Francisco was almost nil, and is even now hardly worthy of the name.

The first outbreak in Peru occurred at Callao in 1903, and a few cases were reported from Mollendo on the 4th of July of the same year. A Peruvian authority, writing on the subject, stated that the first cases had been traced to a cargo of grain or flour which was imported from Mazatlan, Mexico. This is clearly a mistake, as there is no grain exported from Mazatlan.

This theory is hardly tenable in view of the closer and more intimate relations of the Peruvian ports with the Chilean coast and the connections with Santos and Rio through several lines of steamships. Moreover, wheat had been regularly imported into Callao and Australia, Chile, and Argentina for several years prior to the outbreak. In addition, large shipments of rice had been received from Hongkong and Rangoon in 1902 and 1903.

Coquimbo, Chile.—Estimated population, 10,000; prevailing diseases, typhoid fever, typhus fever, tuberculosis, and smallpox. There were no plague statistics and no information could be obtained in regard to an outbreak which it is said occurred several years ago. Exports, nuts, fruits, vegetables, wines, hay, copper ore, and chinchilla (rodent) pelts.

Antofagasta, Chile.—Present estimated population, 28,000, formerly 33,000; prevailing diseases, typhoid fever, tuberculosis, smallpox, and plague. There is no record of the number of cases of the latter disease. Exports, sodium nitrate, copper and silver ores. The Kosmos Line steamships undergo a partial fumigation of empty holds at the hands of the consular agent.

Iquique, Chile.—Estimated population, 38,000; prevailing diseases, bubonic plague, typhoid fever, tuberculosis, and smallpox. Plague has been endemic or enzootic here since 1890. Exports, nitrate is the sole article of export. A plague lazaretto has been provided by the Government.

The empty holds of northward bound Kosmos liners are fumigated by the United States consul. It is a fractional fumigation, as there are not more than one or two holds empty at the time. In view of this fact and the nature of the cargo (saltpeter) Surg. Blue was of the opinion that it would be advantageous to have the fumigation done at Valparaiso in future. At this port the vessels will be practically empty and complete fumigations can be done. This will apply also to vessels touching at Antofagasta.

The danger to be avoided at Iquique lies in the embarkation of passengers and crew. On more than one occasion in the past year cases of plague have occurred among the crews shipped at Iquique by the Kosmos liners. These were apprehended by the Peruvian authorities and by the service officer stationed at Callao. There were four cases of plague of the bubonic type in the lazaretto on June 29, 1910.

Mollendo, Peru.—Estimated population, 2,600; prevailing diseases, typhoid fever, tuberculosis, and plague. Eighteen cases of plague, with 9 deaths, have been reported since February 5, 1910. There was no case in the lazaretto on June 30. Exports, wool (vicuna, alpaca, and sheep), dry salt hides, jerked meat, rubber cocoa leaves, and ores. These articles are brought from the interior, Arequipa, Cuzco, and

Bolivia. Nine vessels have been dispatched to the ports of the United States since January 1, 1910. Plague was reported first on July 4, 1903. A plague lazaretto has been built at this place.

All vessels from Chile destined for ports in Peru are boarded at Mollendo by the Peruvian health authorities, and passengers and crews are inspected. The fumigation performed en route by the engineer of the vessel with the Clayton apparatus was also verified by the officer.

Antiplague measures enforced in Chile.—The solution of the problem of plague eradication has not been as yet undertaken by the Chilean Government. No systematic effort has been made anywhere, so far as could be ascertained, for the elimination of the rat. It is said that Danysz virus was used once at Iquique, but with indifferent success, since there has been no appreciable diminution of the rat population of that town.

Arrivals from Peru by sea undergo inspection, and at times isolation, at Ito or Arica. Vessels likewise are inspected and often fumigated on arriving from Peru. Commerce between Chilean ports, however, is not restricted in any manner. This explains, no doubt, the rapid spread of the disease from port to port.

Lazarettos for the isolation of plague cases have been provided both at Iquique and Antofagasta. These are one-story wooden structures that are not impervious to the ingress of rats and other vermin. Evidences of rat infestation could be plainly seen in the floors and on the walls of these buildings.

The measures used so far in the fight against plague are inadequate, not to say antiquated. They consist of the temporary closure and disinfection of infected houses instead of permanent closure until the premises can be made rat proof. It is obvious that the same mistake is being made here that was made in many ports of the world prior to 1903. Time, money, and energy have been wasted in fruitless attempts to eradicate plague by the isolation of patients and the disinfection of buildings, while the main factor, the rat, is permitted to go unmolested, spreading infection from house to house.

The rodent problem in Chile is not near so difficult or so menacing as that of the United States. Large rat populations are found in the cities, but these are limited as a rule to those localities by reason of the barrenness of the surrounding country. In the States, on the other hand, the continuity of the rodent range from city to city is practically unbroken by the association of the urban with the rural species of the family.

With the exception of the very valuable chinchilla (*Chinchilla lanigera*), there is no rural rodent in northern Chile. This animal lives in the high ranges of the Andes far removed from the domesticated species of the genus Mus. Unless the unexpected should happen, there is little likelihood that this rat, which is rapidly being exterminated for its fur, will become an enzootic host for plague.

APPOINTMENT OF ACTING ASSISTANT SURGEON AT VALPARAISO.

Immediately following the receipt of Surg. Blue's report an acting assistant surgeon was appointed for duty at Valparaiso, Chile, in connection with the fumigating of vessels leaving that port for ports in the United States, and especially in the Hawaiian Islands. The fumigation of vessels at Valparaiso was especially advantageous for the reason that at that port the holds of vessels bound north are empty. Thus has Valparaiso been added to those ports mentioned in the last annual report (p. 176) wherein fumigation for the destruction of rats is being performed when the holds of the vessels are empty. It is the purpose of the bureau to steadily increase the list of such ports, and it was to this end that a paragraph was inserted in the revised quarantine regulations devoted to the periodical fumigation every six months of all vessels trading with foreign ports infected with or suspected of being infected with plague.

Measures Taken Against the Introduction of Cholera from Russia and Italy.

Between May 8 and November 1, 1910, 204,959 cases of cholera occurred in Russia with 95,673 deaths.

From August 17 to November 1, 1910, 1,437 cases occurred in Italy, exclusive of the city of Naples with 769 deaths. Between September 25 and November 1, 1910, there were 377 cases with 130 deaths in Naples proper.

With these conditions prevailing in Russia and Italy, the enormous emigration from these countries to the United States presented a quarantine problem which occupied the immediate and serious consideration by the bureau. The measures instituted to prevent the introduction of the disease into this country may be divided as follows:

1. Quarantine measures enforced at the foreign ports of embarkation.
2. Those enforced during the voyage.
3. Those taken at the various quarantine stations in the United States.
4. Special inspections for the detection of cholera made by service officers engaged in the medical inspection of arriving aliens.
5. The immigration destination notification system.

QUARANTINE MEASURES ENFORCED AT FOREIGN PORTS OF EMBARKATION.

The measures enforced at the foreign ports of embarkation, so far as the present cholera situation in Europe is concerned, date from July 14, 1910, when a request was made through the Treasury Department for the resumption, at certain European ports, of the detention for five days of steerage passengers from the cholera-infected districts in Russia prior to their embarkation to the United States.

The enforcement of the provisions of paragraphs 30, 31, and 32 of the Quarantine Regulations of 1903 (paragraphs 29, 30, and 31, revised regulations of 1910) by the consular officers at Hamburg, Bremen, Antwerp, Rotterdam, and at continental and British ports dates from September 17, 1908, when the prevelance of cholera in Russia made it necessary to provide for the detention of steerage passengers for five days in suitable barracks and for the disinfection of their baggage at the ports of departure.

The regulations also provide that cabin passengers coming from cholera-infected districts embarking at clean or infected ports should produce satisfactory evidence as to their exact place of abode during the five days immediately preceding embarkation.

On January 8, 1910, these restrictions had been temporarily removed on account of the great diminution or almost complete absence of cholera in Russia, but, as stated above, they were resumed on July 14, 1910. On account of the steadily increasing spread of the disease a request was made on August 9 that the consular officers at the ports above mentioned detain for five days prior to their embarkation steerage passengers from all parts of Russia, it being considered impracticable, not to say impossible, for the consular officers to determine whether a given group of emigrants were from a district in Russia not infected with cholera.

Finally, on account of the general prevalence of the disease throughout the Russian Empire and the report of its appearance in Germany and in Italy, a request was made through departmental channels on September 2, 1910, that the consular officers at the ports of Marseille, Havre, and Cherbourg, in France, and the Italian ports of Genoa, Palermo, and Messina be instructed to detain steerage passengers from all parts of Russia and disinfect their baggage prior to embarkation to the United States.

Medical officers of the service are regularly assigned to duty in the American consulates at Naples, Italy, and Libau, Russia.

From Naples, Surg. H. D. Geddings, the senior officer, and Passed Asst. Surg. W. W. King were directed to inspect the Italian ports of Genoa and Palermo, and the port of Marseille in France, for the purpose of securing uniformity in the outgoing quarantine work at those ports.

Asst. Surg. Gen. W. T. Pettus, on leave in England, was directed to make inspections at the various English ports with the same object in view.

Surg. H. R. Carter was detailed to visit the ports of Hamburg and Bremen in Germany, Cherbourg and Havre in France, Antwerp in Belgium, and Rotterdam in Holland, for the purpose of consulting with the United States consuls at those ports regarding the enforcement of the Treasury regulations on outgoing vessels, passengers, and crews bound for United States ports, when said vessels carried passengers or cargo from any port or place in Europe infected with Asiatic cholera. Finally the ports of Trieste and Fiume in Austria-Hungary and Odessa in Russia were included in the huge cordon sanitaire above described, which is now complete and in effective operation.

The outgoing quarantine work performed at the various foreign ports is provided for by the following paragraphs from the United States Quarantine Regulations, 1910:

Special regulations on account of cholera, foreign and insular.—24. At ports where cholera prevails, special care should be taken to prevent the water and the food supply from being infected. The drinking water, unless of known purity, should be boiled, and the food thoroughly cooked and protected against contamination by flies, etc.

25. The latrines of vessels must be so arranged that they, including their discharge pipes, can be made and kept mechanically clean.

26. Unless unavoidable, vessels should not take water ballast from a source contaminated or suspected of contamination by cholera. When unavoidable, the facts will be noted on the bill of health.

29. Steerage passengers and crew coming from cholera-infected districts should be detained five days in suitable houses or barracks located where there is no danger from infection, and all baggage inspected and, if necessary, disinfected.

30. Steerage passengers and crew from districts not infected with cholera, shipping at a port infected with cholera, unless passed through without danger of infection and no communication allowed between such persons and the infected locality, and especially no foodstuffs allowed to be obtained from the infected locality, should be treated as those in the last paragraph.

31. Cabin passengers coming from cholera-infected districts embarking at a clean or an infected port should produce satisfactory evidence as to their exact place of abode during the five days immediately preceding embarkation. And if it appears that they or their baggage have been exposed to infection, the baggage should be disinfected and the passengers detained under medical supervision a sufficient time to cover the period of incubation since last exposure.

32. Should cholera appear in the barracks or houses in which passengers are undergoing detention, no passenger from said houses or barracks who has been presumably exposed to this new infection should embark until after the expiration of the period of incubation of the disease in question subsequent to the last exposure to infection and the application of all necessary sanitary measures.

Special attention is paid to the inspection of intending emigrants, to determine the presence in their baggage or upon their persons of foodstuffs, bottled water, etc., which might have been exposed to infection, and to the destruction of such foodstuffs when found. This inspection is made before and after the period of detention.

While the methods of procedure may differ to a certain degree at the various foreign ports, a description of the routine at such ports as Libau and Naples may be taken as a fair example of the work under consideration.

Emigrants are received until the evening of the sixth day preceding the sailing of the vessel. They are there held for five full days prior to their departure and subjected to a daily medical inspection. A personal inspection of the vessel is made on the day of sailing.

The use of the so-called "quarantine card" during the five days of detention is described fully on page 151 in the report from Libau.

The inspection for the detection and destruction of foodstuffs referred to above, had an unexpected effect upon emigration at Libau, causing many persons to detour via this port to the English ports where they supposed they could escape the outgoing quarantine restrictions in general and the examination for foodstuffs in particular. To forestall any possible danger likely to accrue from such detouring a request was made through the department that the consul general at London be instructed to notify the consular officers at the various British ports to detain for five days all emigrants from Russia and otherwise to enforce the usual restrictions.

Following the appearance on August 17, 1910, of cholera in the Provinces of Bari and Foggia in southeastern Italy, the usual quarantine restrictions were imposed at the Italian ports of Naples, Genoa, and Palermo upon emigrants from the infected districts. At the port of Naples emigrants are detained on board of a hulk, known as the "Massala," anchored in the harbor.

Upon the announcement, on September 25, 1910, of the appearance of cholera in the city of Naples, all steerage passengers from that city were required prior to their embarkation to undergo detention for five days with the usual disinfection of their baggage and the exclusion from it as well as from the persons of emigrants of all foodstuffs, bottled water, etc.

In Italy the service has at this writing representatives at Naples, Genoa, Palermo, Messina, and Catania. All of the Italian ports are under the control of Surg. Geddings at Naples, whose force was still further augmented by the detail of Surg. J. M. Eager, an officer with previous service in Italy.

Surg. Geddings was also given the authority to employ any additional help necessary for the proper enforcement of the restrictions.

MEASURES ENFORCED DURING THE VOYAGE.

The United States Quarantine Regulations include the following requirements at sea:

46. The master of a vessel should observe the following measures on board his vessel:

(*a*) The water-closets, forecastle, bilges, and similar portions of the vessel liable to harbor infection should be disinfected and frequently cleansed.

(*b*) Free ventilation and rigorous cleanliness should be maintained in all portions of the ship during the voyage and measures taken to destroy rats, mice, fleas, flies, mosquitoes, and all vermin.

(*c*) A patient sick of a communicable disease should be isolated and one member of the crew detailed for his care and comfort, who, if practicable, should be immune to the disease.

(*d*) Communication between the patient or his nurse and other persons on board should be reduced to a minimum.

(*e*) Used clothing, body linen, and bedding of the patient and nurse should be immersed at once in boiling water or in a disinfecting solution.

(*f*) The compartment from which the patient was removed should be disinfected and thoroughly cleansed. Articles liable to convey infection should remain in the compartments during the disinfection when gaseous disinfection is used.

(*g*) Any person suffering from malaria or yellow fever should be kept under mosquito bars and the apartment in which he is confined closely screened with mosquito netting. All mosquitoes on board should be destroyed by burning pyrethrum powder (Persian insect powder) or by fumigation with sulphur. Mosquito larvæ (wigglers or wiggle tails) should be destroyed in water barrels, casks, and other collections of water about the vessel by the use of petroleum (kerosene). Where this is not practicable, use mosquito netting to prevent the exit of mosquitoes from such breeding places.

(*h*) In the case of plague special measures must be taken to destroy rats, mice, fleas, flies, and other vermin on board.

(*i*) In the case of typhus special measures should be taken in addition to disinfection to destroy vermin.

(*j*) In the case of cholera, typhoid fever, or dysentery, the drinking water should be boiled and the food thoroughly cooked. The discharges from the patient should be immediately disinfected and thrown overboard.

47. An inspection of the vessel, including the steerage, should be made by the ship's physician once each day.

48. Should cholera, yellow fever, smallpox, typhus fever, plague, or any other communicable disease appear on board a ship while at sea, those who show symptoms of these diseases should be immediately isolated in a proper place. The ship's physician should then immediately notify the captain, who should note same in his log, and all of the effects liable to convey infection which have been exposed to infection should be destroyed or disinfected.

49. The hospital should be disinfected as soon as it becomes vacant.

50. The dead, except those dead of yellow fever, should be enveloped in a sheet saturated with one of the strong disinfecting solutions, without previous washing of the body, and at once buried at sea or placed in a coffin hermetically sealed.

51. A complete clinical record should be kept by the ship's surgeon of all cases of sickness on board and the record delivered to the quarantine officer at the port of arrival.

52. The following disinfecting solutions are recommended for use at sea:

Formulæ for strong disinfecting solutions.

BICHLORIDE OF MERCURY. (1:500.)

Bichloride of mercury	1 part.
Sea water	500 parts.
Mix.	

CARBOLIC ACID. (5 PER CENT.)

Alcohol	50 parts.
Carbolic acid, pure	50 parts.
Mix.	
Then add fresh water	900 parts.

Formulæ for weak solutions.

BICHLORIDE OF MERCURY. (1:1,000.)

Bichloride of mercury	1 part.
Sea water	1,000 parts.

CARBOLIC ACID. (2½ PER CENT.)

Carbolic acid, pure	25 parts.
Fresh water	1,000 parts.

FORMALIN. (5 PER CENT.)

Formalin (or formol)	50 parts.
Water	950 parts.

It is suggested that a vessel should carry for every 100 passengers: Bichloride of mercury, 5 pounds; carbolic acid, 10 pounds; alcohol 10 pounds, and formalin, 10 pounds; 100 pounds sulphur, and 50 pounds pyrethrum, and 12 Dutch ovens, about 12 inches diameter.

Not only were the majority of the steamship lines furnished with these regulations, but, in accordance with the general instructions therein contained, a general order was issued to practically all of the trans-Atlantic lines running into the ports of New York, Boston, Philadelphia, Baltimore, Montreal, Halifax, and Norfolk to instruct the ship's surgeons to carefully inspect all passengers and crews, and to particularly note their condition during the 24 hours prior to their arrival at the ports above mentioned.

MEASURES TAKEN AT THE QUARANTINE STATIONS IN THE UNITED STATES.

Upon the arrival of vessels from cholera-infected ports or from ports from which persons from infected districts embark, the vessel, together with the personnel and passengers, are subjected to a careful inspection. This includes a personal inspection of the individual, an examination of any person ill, and a microscopical examination of the stools of any reported to have suffered from a gastrointestinal disturbance on the voyage, or whose appearance would so indicate.

The vessel is held in quarantine pending any examination thought warranted by circumstances. At this inspection the work performed at foreign ports is checked up and failures to comply with the prescribed restrictions are discouraged by appropriate measures.

While the quarantine regulations are explicit in regard to the inspection of vessels from cholera-infected ports, and the quarantine officers are a competent and resourceful body of men, the bureau, through special instructions, discussed those paragraphs of the quarantine regulations dealing with cholera and issued a general order calling for special vigilance at the quarantine stations.

On account of the quarantine problem presented at the ports of New York and Boston, a representative from the bureau was detailed to visit these ports for the purpose of consulting with the quarantine officers regarding any special measures to be taken against the introduction of cholera into this country.

The bureau has notified all quarantine officers and the officers engaged in the medical inspection of arriving aliens of its equipment maintained at the Hygienic Laboratory for the bacteriological examination of any suspected material forwarded for this purpose.

These officers have likewise been notified that in cases of emergency an expert could be dispatched from the Hygienic Laboratory to conduct the investigation at the port or place where the suspected case is being held.

SPECIAL INSPECTIONS FOR THE DETECTION OF MILD OR PREVIOUSLY UNRECOGNIZED CASES OF CHOLERA MADE BY SERVICE OFFICERS WHILE EXAMINING ARRIVING ALIENS.

The medical officers of the service engaged in the inspection of arriving aliens were some time past communicated with in regard to the invaluable aid which they might render by a careful endeavor on their part to detect cases of cholera which on account of obscure symptoms might have passed the regular quarantine inspection. The result has been that the medical inspection of aliens can be rightfully classed as an important line of quarantine defense. This is evidenced by the recent detection by the service officer engaged in the medical inspection of aliens at Quebec, Canada, of a case of cholera which had been passed through the quarantine at that port.

The alien, a Russian immigrant arriving at Quebec on the steamer *Royal George* during November, 1910, presented at the time of the examination on the line symptoms so suspicious of cholera that the medical officer, Acting Asst. Surg. C. A. Bailey, advised the return of the vessel, together with the sick Russian and the other passengers and personnel, to the quarantine station.

A bacteriological examination of material from this case was made by Prof. Adami, of the McGill University, with the result that the case was pronounced one of Asiatic cholera. Inasmuch as this Russian was destined to a point in the State of Wisconsin, the importance of this timely discovery can hardly be overestimated.

THE IMMIGRANT DESTINATION CERTIFICATION SYSTEM.

It was thought that the measures above described were ample in scope and effectiveness to meet the cholera conditions, and the quarantine problem caused in consequence thereof, save in one particular, and that was in the case of what are known as "cholera carriers."

The fear of the "cholera carrier" from a quarantine standpoint arises from the uncertainty as to the duration of the infectivity of the individual. While the majority of observers assert that "carriers" lose their vibrios in 10 days, certain authorities claim that the vibrios are carried for much longer periods, even as long as 69 days. The average time elapsing between the beginning of the period of detention of emigrants at a foreign port and the landing at the United States port is about 17 days. This 7 days' excess over the commonly accepted period during which vibrios are carried is a source of much safety and confidence. But the "cholera carriers" of long duration, however infrequently they may be encountered, presented a problem which the bureau could only meet by the establishment of a system by which the services of the local health officers throughout the United States could be utilized in keeping under surveillance those localities wherein newly arrived immigrants are domiciled.

In the organization of the system, which received the approval of the Treasury Department and the Department of Commerce and Labor, and by the joint action of the bureau and the Bureau of Immigration, an arrangement was effected at all of the large immigration stations by which the destination of each immigrant from a cholera-infected country is recorded on a separate card.

The cards are then segregated according to the States to which the immigrant is destined and mailed daily to the secretaries of the various State boards of health for further distribution to the local health officers in each State. The facsimile of the face and back of the card below will show the form in which the information is sent.

IMMIGRANT DESTINATION CARD.

Port of______________________

MONTH.

Jan.	Feb.	Mar.	Apr.	May	June
July	Aug.	Sept.	Oct.	Nov.	Dec.

DAY.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Name of immigrant____

From what country?______ *Italy*______ *Russia*______

(Check indicates the country.)

DESTINATION.

State.	Ala.	Cal.	Del.	Ga.	Ind.	Ky.	Md.	Minn.
	Ariz.	Colo.	D. C.	Idaho.	Iowa.	La.	Mass.	Me.
	Ark.	Conn.	Fla.	Ill.	Kans.	Me.	Mich.	Mont.
	Nebr.	N. J.	N. C.	Okla.	R. I.	Tenn.	Vt.	W. Va.
	Nev.	N. Mex.	N. Dak.	Oreg.	S. C.	Tex.	Va.	Wis.
	N. H.	N. Y.	Ohio.	Pa.	S. Dak.	Utah.	Wash.	Wyo.

Town or city____________________ Street and number____________________

Initials of inspector_______________

TREASURY DEPARTMENT, *Washington, D. C.*

On information received from the Commissioner of Immigration this card is sent to the State boards of health that they may be informed of immigrants coming into the States from countries in which at the present time cholera is prevalent, whether generally prevalent or only in certain districts. The person named on the reverse has been subject to the quarantine regulations at foreign ports, the quarantine inspection at the domestic port, and also the subsequent immigration examination. Notwithstanding these precautions, it is advisable to exercise surveillance over arrived immigrants from the cholera-infected countries as named on the reverse, and to this end it is suggested that this card be sent to the local health officer at the point of destination, so that he may examine into any case of sudden or fatal gastroenteritis or diarrhea among immigrants to determine its actual nature, and if any doubt exists, to report to the State Board of Health or to the Public Health and Marine-Hospital Service at Washington. This card should not be confounded with the information required by paragraph 67, United States Quarantine Regulations promulgated October 20, 1910, relating to immigrants who have arrived on a vessel on which infection has appeared and whose destination after quarantine detention and disinfection would be sent by telegraph or mail.

SURGEON GENERAL,
United States Public Health and Marine-Hospital Service.

The bureau has received so many letters commending the usefulness of the immigration-destination system that its success as an important public-health measure has been assured.

ASIATIC CHOLERA IN ROTTERDAM.

On August 20, 1909, cholera appeared in Rotterdam, Netherlands, and up to September 11, 1909, when the city was declared free from the disease, there occurred 34 cases with 15 deaths. It was believed that the disease was introduced into Rotterdam from Russia, several ships from the latter country having been in the port at the time of the appearance of the disease. Immediately upon the receipt of information of the outbreak, Asst. Surg. R. A. C. Wollenberg, who was stationed in the office of the American consul at Naples, was ordered to proceed to Rotterdam for duty in the office of the American consul general at that port.

Dr. Wollenberg not only signed bills of health in conjunction with the consular officer, but he kept the bureau constantly informed as to the progress of the outbreak of the disease, and cabled daily the name of each vessel leaving Rotterdam for an American port, giving the date of departure and the ports of destination. The bureau upon receipt of this information would immediately impart it to the quarantine officers at the United States ports directly concerned.

Detailed reports concerning the outbreak are to be found on pages 1427 and 1471 Public Health Reports for 1909.

Dr. Wollenberg reports that the measures instituted for suppressing the cholera in Rotterdam were scientific in every particular, and were carried out vigorously, as the brilliant results attested. Much credit is due the honorable the mayor of Rotterdam, and his associates, Mr. A. van der Perk, Dr. Hymans van der Bergh, and Dr. R. de Y. de Yong.

REPORTS FROM THE NATIONAL QUARANTINE STATIONS.

During the fiscal year ending June 30, 1910, at the various stations of the United States, a total of 7,271 vessels were inspected, including 325 disinfected, either for the destruction of mosquitoes as a precaution against the introduction of yellow fever, or for the destruction of rats and other vermin as a precaution against plague. In addition 624 vessels were spoken and passed, making a grand total of 7,895 vessels and 407,569 passengers and crews passing under the observation of the service at ports in the continental United States.

Following are the summaries of the operations at the various quarantine stations:

Alexandria (Va.) quarantine.—Acting Asst. Surg. Arthur Snowden in charge. Five vessels, carrying 66 members of crew were inspected and passed.

At Alexandria, Va., the quarantine inspection is also made of vessels destined to Washington, D. C.

Eastport (Me.) quarantine.—Acting Asst. Surg. E. M. Small in charge.

Eight hundred and twenty steamers and 58 sailing vessels were inspected. These vessels carried a total of 32,923 passengers and 22,865 crew.

Portland (Me.) quarantine.—Surg. J. M. Eager in command.

One hundred and twenty-nine steamers and 32 sailing vessels were inspected and passed. These vessels carried 6,448 crew and 6,882 passengers.

Perth Amboy (N. J.) quarantine.—Acting Asst. Surg. Charles W. Naulty, jr., in charge.

Six steamers were spoken and passed; 57 steamers and 3 sailing vessels were inspected and passed and 1 steamer was fumigated. There were 1,391 crew on these vessels.

Reedy Island quarantine.—Post-office address, Port Penn, Del.; telegraphic address, Reedy Island, Del. Passed Asst. Surg. Charles W. Vogel in command.

Twelve hundred and forty-two vessels were inspected and passed, of which 1,147 were steamers and 95 were sailing vessels. Eleven vessels were spoken and passed and 1 was fumigated. Upon the steamers 40,701 crew and 35,733 passengers were inspected. Upon the sailing vessels 1,058 crew were inspected. Temperatures were taken of the crews of 48 vessels coming from ports suspected of yellow-fever infection, and glandular examinations were made of the crews of 16 vessels from ports where plague prevailed.

On May 3 the steamship *Main* from Bremen arrived at the Reedy Island quarantine station. One steerage passenger with an eruption was removed to the isolation hospital for observation, and the steamer and personnel allowed to proceed as the patient had been strictly isolated on board the vessel and all steerage passengers vaccinated. After two days' observation a diagnosis of smallpox was made in the case of the detained passenger.

Delaware Breakwater quarantine.—Post office and telegraphic address, Lewes, Del., Acting Asst. Surg. George G. Hart in charge: Thirty-seven steamers and 16 sailing vessels were inspected. These vessels carried a total of 27 passengers and 3,479 crew.

Cape Charles quarantine.—Passed Asst. Surg. Hugh S. Cumming in command: Two hundred and eighty-eight steamers and 17 sailing vessels were inspected. On these vessels were 23,441 crew and 421 passengers. During the year 1 vessel was quarantined and 1 fumigated.

The steamer *Harley* arrived during the year from Puerto Velho (a place 1,600 miles up the Amazon River) carrying a crew every member of which was suffering from malaria in some form. Five of the crew had a severe type of æstivo-autumnal fever.

Washington (N. C.) quarantine.—Acting Asst. Surg. J. C. Rodman in charge. There were no transactions during the year.

Cape Fear quarantine.—Post office and telegraphic address, Southport, N. C.; Asst. Surg. William M. Bryan in command: Forty-three steamers and 6 sailing vessels were inspected, and 1 vessel spoken and passed. Ten vessels were fumigated. These vessels carried 1,357 crew and 1 passenger.

Georgetown (S. C.) quarantine.—Acting Asst. Surg. M. P. Moorer in charge: Three sailing vessels were inspected and 3 vessels spoken and passed. These vessels carried 3 passengers.

Charleston (S. C.) quarantine.—Passed Asst. Surg. Baylis H. Earle in command: One hundred and twenty-nine steamers and 3 sailing vessels were inspected and passed. Two vessels were quarantined and 2 fumigated. The vessels inspected carried a total of 30 passengers and 4,651 crew.

Beaufort (S. C.) quarantine.—Acting Asst. Surg. Christopher G. Hay in charge: Two steamers and 4 sailing vessels were inspected and passed.

Port Royal (S. C.) quarantine.—Acting Asst. Surg. William P. Gibbes in charge: One sailing vessel was inspected during the year.

Savannah (Ga.) quarantine.—Asst. Surg. C. M. Fauntleroy in command: One hundred and forty steamers and 5 sailing vessels were inspected, and 37 vessels spoken and passed. Two vessels were quarantined and 2 fumigated. The vessels inspected carried 3,803 crew and 28 passengers.

South Atlantic quarantine.—Pharmacist F. L. Brown in charge of personnel and property: This station now is maintained under skeleton organization for refuge or emergency purposes. No transactions during the year.

Brunswick (Ga.) quarantine.—Acting Asst. Surg. J. A. Moncure in charge: Nineteen steamers and 24 sailing vessels were inspected, carrying 641 crew and 47 passengers.

Tampa Bay (Fla.) quarantine.—Post office address, Fort De Soto, Fla. Telegraphic address, via Palmetto, Fla. Passed Asst. Surg. H. McG. Robertson in command.

One vessel was spoken and passed, 86 steamers and 112 sailing vessels were inspected and passed, and 34 steamers and 2 sailing vessels were disinfected. These vessels carried a total of 112 passengers and 5,119 crew.

Of the vessels disinfected, 28 steamers and 1 sailing vessel were fumigated for the destruction of rats, these vessels having come from ports where bubonic plague prevailed or was known to have recently existed; 22 steamers and 1 sailing vessel were fumigated for the destruction of mosquitoes, coming from ports known, or supposed to be infected with yellow fever.

Sixteen of these vessels were from ports infected with both plague and yellow fever.

The number of rats found dead, on vessels fumigated for their destruction, varied from none to 122, the total number for the year approximating 500.

The majority of vessels fumigated at this station were found singularly free from rats, owing to the fact that they are engaged chiefly in the coal and phosphate trade, and have been, in most instances, fumigated en route by accredited medical officers of the service stationed in the various West Indian ports.

The largest number of rats found on any steamer was 122 on the British steamer *Potomac*, from Trinidad.

No quarantinable diseases were found on any of the vessels arriving during the year.

Fifteen seamen were taken ashore for observation and detention, as a matter of precaution. These were all cases of malarial fever, except 1, rheumatism (gonorrheal), and were found on vessels from tropical ports.

Cedar Keys (Fla.) quarantine.—Acting Asst. Surg. J. H. Coffee in charge.

There were no transactions during the fiscal year.

Cumberland Sound quarantine.—Post office and telegraphic address, Fernandina, Fla. Acting Asst. Surg. J. Louis Horsey in charge.

One hundred vessels were spoken and passed, 77 steamers were inspected and passed, and 2 steamers were disinfected; 17 sailing vessels were inspected and passed. On these vessels there were 2,358 crew and 29 passengers.

St. Johns River quarantine.—Post office and telegraphic address, Mayport, Fla. Acting Asst. Surg. Neil Alford in charge.

Seventy-three vessels were inspected and passed. On these vessels there were 2,682 passengers and crew.

Biscayne Bay quarantine.—Post office and telegraphic address, Miami, Fla. Acting Asst. Surg. James M. Jackson, jr., in charge.

Two hundred and sixty-four vessels were spoken and passed; 35 steamers and 65 sailing vessels were inspected and passed. These vessels carried a total of 5,596 passengers and crew.

Key West (Fla.) quarantine.—Acting Asst. Surg. S. D. W. Light in charge.

During the year 275 steamers and 63 sailing vessels were inspected and passed. One vessel was disinfected and held for observation. The vessels inspected carried a total of 27,286 passengers and crew.

In a hurricane, which occurred on October 12, 1909, the detention barge *McAdam* at Key West, Fla., was sunk and damaged to such an extent that it was necessary to officially declare the vessel a total loss, after a board of investigation had made a report to this effect.

Knights Key (Fla.) quarantine.—Acting Asst. Surg. Joseph Y. Porter, jr., reports 106 vessels inspected, on which there were 6,542 passengers and crew.

Three vessels from Hamburg, Germany, were inspected at Bahia Honda, Fla. No vessels were detained or fumigated during the year.

On October 12, 1909, the disinfecting steamer *Sanator* and the boarding launch *Curlew* were driven ashore at Hog Key, Fla., in a severe hurricane. The *Sanator* was irreparably damaged, having lost her rudder, rudder post, and part of the keel. Several large holes were made in the hull of the vessel, so that it was necessary to shore it up on the beach where it was carried by the action of the waves. The damages sustained by the launch *Curlew* were not serious, and were easily repaired.

Bocagrande quarantine.—Post office and telegraphic address, South Bocagrande, Fla. Acting Asst. Surg. W. Barnes in charge.

During the year 8 vessels were spoken and passed.

Pensacola (Fla.) quarantine.—Acting Asst. Surg. R. C. White in charge.

During the year 37 vessels were boarded and passed, 32 vessels were spoken and passed, 128 steamers were inspected and passed, and 24 steamers were disinfected; 49 sailing vessels were inspected and passed and 18 sailing vessels were disinfected. On these vessels there were 6,218 crew and 25 passengers, and while no cases of quarantinable disease occurred, 4 cases of malarial fever, remittent, were removed to the hospital at the station for observation and treatment.

St. George Sound quarantine.—Post office and telegraphic address, Carrabelle, Fla. Acting Asst. Surg. B. B. Blount in charge.

Forty-seven vessels, carrying passengers and crew aggregating 343 persons, were inspected and passed.

Mobile (Ala.) quarantine.—Passed Asst. Surg. L. D. Fricks in command.

Seven hundred and thirty-four vessels entered quarantine, of which 489 were steamships and 245 sailing vessels; 686 were inspected and passed, 21 were detained in quarantine, and 27 were fumigated. On these vessels 14,644 crew and 394 passengers were inspected. Eighteen persons having a temperature of 38° or more were removed to quarantine for observation.

During the year no case of quarantinable disease was encountered.

The rebuilding of the station is now completed, and the routine quarantine duties present no special difficulties.

The majority of the vessels entering quarantine at this port are fruiters which have been loaded under the supervision of a service officer at one of the Central American fruit ports. This, together with the fumigation of vessels by service officers in the Tropics, tends greatly to facilitate the work at this station.

Pascagoula (Miss.) quarantine.—Acting Asst. Surg. B. F. Duke in charge. Eighteen steamers and 129 sailing vessels were inspected and passed. These vessels carried 1,814 passengers and crew. Three vessels were fumigated.

Gulf quarantine station.—Post office and telegraphic address, Biloxi, Miss. Passed Asst. Surg. John T. Burkhalter in command.

The transactions were as follows: Vessels spoken and passed—steamers 20, sailing vessels 1. Boarded and passed—steamers 1. Disinfected and passed—steamers 8, sailing vessels 5. Inspected and passed—Steamers 54, sailing vessels 74. Disinfected and held—

steamers 5, sailing vessels 11. These vessels carried a crew of 2,798 men, 52 passengers, and 3 stowaways.

No cases of quarantinable disease were encountered.

New Orleans quarantine.—Post-office address, Quarantine, La.; telegraphic address, via New Orleans, La. Passed Asst. Surg. R. H. von Ezdorf in command.

TRANSACTIONS AT THE NEW ORLEANS QUARANTINE STATION AND THE SUBSTATION AT PORT EADS.

	Steamships.	Sailing vessels.	Total.
Inspected and passed	694	2	696
Inspected and detained for fumigation	91	9	100
Inspected and held for 5 days	7	10	17
Inspected and held to complete a period of 5 days from date of fumigation at a foreign port	43	0	43
Inspected and held for completion of diagnosis of cases of sickness found on arrival	8	1	9
Inspected and passed from domestic ports	48	0	48
Spoken and passed	45	0	45
Vessels fumigated and disinfected	130	17	147
Total number of vessels inspected	891	22	913
Number of crew inspected	32,499		
Number of passengers inspected	8,297		

A total of 1,161 vessels were inspected at the port of New Orleans and at the substation at Port Eads.

No quarantinable diseases were observed at the station during the fiscal year.

On account of a rise in temperature a number of persons (chiefly crew) were removed from vessels to the quarantine hospital for observation. The following is a list of diseases treated in the hospital at the quarantine station during the fiscal year ended June 30, 1910:

Malaria	25
Typhoid	10
Tuberculosis	2
Tubercular pneumonia	1
Pleurisy	2
General diseases	57
Temporary elevations of temperature, otherwise in good health	12
Total	108

San Diego (*Cal.*) *quarantine.*—Acting Asst. Surg. W. W. McKay in charge.

Two hundred and thirty-four steamers and four sailing vessels were inspected and passed. One vessel was quarantined and one fumigated. These vessels carried crews aggregating 3,390, and 1,480 passengers.

San Francisco quarantine.—Post office and telegraphic address Angel Island, Cal. Passed Asst. Surg. F. E. Trotter in command.

Eight vessels were spoken and passed, and 88 were boarded and passed; 376 steamers were inspected and passed, and 29 were disinfected; 179 sailing vessels were inspected and passed, and 10 were disinfected. These vessels carried a total of 49,308 crew and 46,179 passengers. Of these vessels 287 were from plague and cholera infected ports, and 79 were from yellow-fever ports.

Of the vessels requiring fumigation 29 were detained to kill rats, 2 vessels on account of having had plague on board during the voyage, 2 on account of having smallpox on board on arrival, and 2 with a history of having had cases during the voyage. Four vessels were fumigated by request for the purpose of destroying rats and other vermin, as follows: One revenue cutter, two transports, and one coasting steamer. From the vessels that were fumigated a total of 510 rats were obtained, and these were sent to the plague laboratory, San Francisco, where Passed Asst. Surg. McCoy reported them all negative.

On the steamers were 44,611 crew and 43,453 passengers. The sailing vessels carried 4,697 crew and 2,726 passengers, a total personnel of 95,487, of whom it was deemed necessary to detain for quarantinable diseases 3,210 persons.

Port Townsend (Wash.) quarantine and subports.—Surg. J. H. Oakley in command.

Two hundred and fifty vessels were boarded; of these 143 were steamers, and the remaining 107 sailing vessels. Of the total number of vessels boarded 245 were inspected and passed, and 5 steamers were detained for disinfection in whole or in part, as the circumstances demanded. The 250 vessels carried a total of 12,409 passengers, and their crews numbered 14,299.

In December the U. S. S. *Burnside* received a thorough fumigation for the destruction of vermin.

During February and March, 1910, 11 cases of smallpox were received at the station. Four of the cases were from the U. S. S. *Burnside* and 7 from the U. S. S. *Washington*. Of the 11 cases 4 died and 7 recovered.

In April the U. S. S. *Rush* received a thorough fumigation for the destruction of vermin.

In January a case of leprosy was received from the marine hospital for isolation.

Port Angeles, Wash. (subport).—Six sailing vessels, carrying 66 men in their crews, were inspected and passed during the year.

South Bend, Wash. (subport).—Four sailing vessels, carrying 48 men in their crews, were inspected and passed during the year.

Columbia River (Oreg.) quarantine and subports.—Post office and telegraphic address, Astoria, Oreg. Passed Asst. Surg. J. M. Holt in command.

During the year 35 steamers and 54 sailing vessels were inspected and passed. These vessels carried 2,960 passengers and crew.

Coos Bay quarantine (substation).—Post office and telegraphic address, North Bend, Oreg.

One steamer, with 10 crew, was inspected and passed.

Siuslaw and Umpqua River quarantine (subport).—No transactions during the year.

Yaquina Bay quarantine (substation).—No transactions during the year.

TEXAS-MEXICAN BORDER INSPECTION.

El Paso, Tex.—Acting Asst. Surg. E. Alexander reports that during the year 9,980 passengers were inspected. There were 1,552 vaccinations.

Laredo, Tex.—Acting Asst. Surg. H. J. Hamilton reports that during the year 723 passenger trains, carrying 46,835 passengers, were inspected; 11,661 aliens were inspected and 584 persons were vaccinated. The death and embalming certificates, together with containers for 16 cadavers, were inspected, and 12 persons were detained to complete the period of five days from port of departure. Five cases of smallpox were discovered and returned to Mexico.

Eagle Pass, Tex.—Acting Asst. Surg. Lea Hume reports that during the year 15,343 passengers were inspected. During the month of December, 1909, one family of six persons was refused admission and returned to Mexico on account of the fact that several members of said family were suffering from variola.

Brownsville, Tex.—Acting Asst. Surg. George D. Fairbanks in charge. No transactions. (Station opened Aug. 2, 1910.)

SUPPLEMENTAL INSPECTION SERVICE AT NEW ORLEANS.

This supplemental inspection service was established March 16, 1907, for the purpose of keeping under observation all persons from any port or place which might possibly be infected with yellow fever or plague until the incubation periods of these diseases were passed. Although temporarily discontinued November 15, 1909, during the winter months, it was resumed April 1, 1910.

During the seven and one-half months of this fiscal year, when the service was in active operation, 24,853 persons were inspected and 19,762 members of regular crews kept under surveillance while in port. The following table gives the transactions in detail:

TRANSACTIONS AT NEW ORLEANS, LA., SANITARY INSPECTION OFFICE, YEAR ENDING JUNE 30, 1910.

Month.	Number of vessels.	Number of crew.	Number of passengers.	Number of crew discharged.	Number of passengers to New Orleans via other ports.	Total number of persons inspected on arrival.	Total number of passengers at New Orleans giving destination in infectible territory.	Total number of passengers at New Orleans giving destination in noninfectible territory.	Total number of persons kept under surveillance.	Number of passengers destined for noninfectible points finally passed in New Orleans.	Total number of passengers kept under surveillance.	Number of cases illness reported aboard vessels.	Total number of persons not seen for final inspection.
1909.													
July	75	2,868	594	99	13	3,293	289	305	2,993	18	310	19	......
August	74	2,749	651	78	5	3,405	390	261	3,151	12	407	9	3
September	76	2,601	563	56	6	3,170	365	198	3,000	34	405	2	1
October	70	2,433	507	52	3	2,943	297	214	2,757	27	327	9	2
November 15	32	1,244	297	5	......	1,541	152	145	1,401	5	155	......	......
1910.													
April	79	2,745	809	55	11	3,565	418	391	3,011	40	245	14	21
May	78	2,722	799	52	8	3,529	389	410	3,009	33	287	13	6
June	77	2,582	806	70	9	3,407	411	395	2,888	26	307	10	13
	561	19,762	5,016	469	50	24,853	2,711	2,318	22,310	195	2,443	76	46

Supplemental Inspection Service at Mobile, Ala.

This inspection service, similar to the one maintained at New Orleans, has been conducted by Surg. G. M. Guiteras. All the personnel of vessels arriving at Mobile from the Tropics are held under observation after having passed the regular inspection at the quarantine station. The transactions since April 1 to June 30, 1910, are as follows:

	April.	May.	June.	Total.
Number of vessels arriving	54	59	49	162
Number of times inspected	83	104	86	273
Number of passengers entering Mobile	25	63	32	120
Number of passengers for New Orleans	14	9	15	37
Number of passengers for other points	9	44	15	68
Number of passengers from New Orleans	5	6	9	20
Number of passengers remaining in Mobile	3	10	2	15
Number of seamen discharged	120	137	103	360
Number of sick removed from vessels	5	10	10	25
Number of crew inspected	1,812	2,278	1,904	5,994

This *sanitary inspection service* was inaugurated promptly on the 1st of April and has been working smoothly and efficiently during the time covered by this report.

The method of procedure is as follows:

All vessels from tropical ports, or from ports suspected or infected with plague or other quarantinable disease, are inspected on arrival at Mobile, the temperatures of crews and passengers being taken. When the inspection work is for the purpose of guarding against yellow fever (as it is in the vast majority of cases), the inspection of crews is continued daily until six full days have elapsed since the last possible contact—that is, since the fumigation of the vessel at the port of departure. Passengers on such vessels are allowed to land. If remaining in Mobile, they are inspected daily; if en route to some other locality within the yellow-fever zone, the health authorities at the point of destination are notified of the expected arrival of such passenger with the request that he be kept under observation until the termination of six full days from the original port of departure.

Many vessels arrive at Mobile from tropical ports within two or three days, and formerly it was found rather difficult to control the crews for the four or three days that they were subject to inspection. This difficulty has been completely removed through the cooperation of the foreign consuls, the United States shipping commissioner, the immigration inspector, and the masters and agents of the vessels themselves, to each and all of whom much credit is due.

With the assistance above mentioned it is possible to keep the crews of vessels under constant surveillance. For instance, through the arrangement with the foreign consuls and the United States shipping commissioner, no seaman is discharged from a foreign or American vessel hailing from a tropical port until the full six days' inspection from the port of departure has been completed. Occasionally, a seaman deserts, and it then becomes the duty of the inspector to hunt him up in sailors' boarding houses or in other places where such men are likely to be found. In such cases the active cooperation of both the chief of police and the sheriff's office is available.

The inspection of arriving vessels and those lying at anchor in the stream are made possible through the courtesy of the collector of customs at Mobile, who has placed his inspectors' launch at the disposal of the service officers.

Surg. Guiteras is assisted by Acting Asst. Surg. Carter, of whose zeal and efficiency special mention should be made.

New Quarantine Stations.

THE NEW ORLEANS QUARANTINE STATION.

As mentioned in previous annual reports of the service, the New Orleans quarantine station and its substation Port Eads, and the stations at Rigolettes, Atchafalaya, Lake Charles, and Lake Borgne, formerly operated by the State of Louisiana, passed into the charge of the Public Health and Marine-Hospital Service on April 1, 1907, and have been operated by it continuously since that time. Owing to the failure on the part of the State of Louisiana to render a clear title to certain of the lands required in connection with the station, much litigation has been necessary, so that the deed was not executed until the 2d of December, 1909. Since that time every effort has been made to improve the station and to make the extensive repairs to the buildings which were urgently needed.

It is proposed, among other additions and improvements to the station, to provide a new building for the detention of crews of vessels.

THE GALVESTON QUARANTINE STATION.

Under the provisions of the act of Congress, approved June 19, 1906, a board was convened by the department on October 7, 1909, to select a site for a national quarantine station at or near Galveston, Tex.

In accordance with the report of the board, dated November 19, 1909, the department, in a letter dated December 13, 1909, requested the honorable the Secretary of War to transfer the site recommended and described in the report of the board.

The site selected comprises about 25 acres of submerged land, a portion of the military reservation on Pelican Spit, Galveston Harbor. The site is only about 500 feet from the present channel, and when the proposed dredging to the established harbor line is completed it will be only 100 feet from the new and widened channel.

The site for the quarantine station was transferred by an official order from the War Department, dated February 16, 1910.

Immediately following the transfer a representative of the Supervising Architect's office was ordered to Galveston to draw up tentative plans for the quarantine station and its equipment.

The preparation of complete plans and specifications for the buildings and wharf are now in progress.

TABLE GIVING TRANSACTIONS AT NATIONAL QUARANTINE STATIONS FOR THE FISCAL YEAR ENDING JUNE 30, 1910.[1]

Stations.	Steamers inspected.	Sailing vessels inspected.	Total number of vessels inspected.	Number of vessels spoken and passed.	Number of vessels quarantined.	Number of vessels fumigated.	Total number of passengers and crews inspected.
Alexandria, Va	1	4	5				66
Beaufort, S. C	2	4	6				92
Biscayne Bay	35	65	100	264			5,596
Bocagrande, Fla				8			
Brunswick, Ga	19	24	43	32			688
Cape Charles	288	17	305		1	1	23,828
Cape Fear	43	6	49	1	10	10	1,358
Charleston, S. C	129	3	132		2	2	4,681
Columbia River, Oreg., and subports	35	54	89				2,960
Coos Bay (substation)		1	1				10
Cumberland Sound	77	17	94	100		2	3,387
Delaware Breakwater	37	16	53				1,885
Eastport, Me	820	58	878				55,788
Eureka, Cal	12	13	25				574
Georgetown, S. C		3	3	3			23
Gulf Quarantine	54	74	128	22	16	13	2,853
Key West, Fla	275	63	338		1		27,286
Knights Key, Fla	106		106				6,542
Mobile, Ala	489	245	734		21	27	15,038
New Orleans	694	2	696	45	69	147	9,993
Pascagoula, Miss	18	129	147	4		3	1,814
Pensacola, Fla	128	49	177	57	11	42	6,243
Perth Amboy, N. J	57	3	66	6		1	1,391
Port Angeles, Wash		6	6				66
Port Inglis, Fla	24		24	22	3	1	791
Portland, Me	129	52	181				13,280
Port Royal, S. C		1	1	1			10
Port Townsend, Wash., and subports	143	107	250	2		5	26,708
Reedy Island	1,147	95	1,242	11	1	1	77,492
Redondo, Cal	8	8	16				461
San Diego, Cal	234	4	238		1	2	4,870
San Francisco, Cal	376	179	555	8	6	39	95,487
Santa Barbara, Cal	4	17	21				436
San Pedro, Cal	40	3	43				2,363
Savannah, Ga	140	5	145	37	2	2	3,831
South Bend, Wash		4	4				48
St. George Sound	1	46	47				343
St. Johns River	35	38	73				2,682
Tacoma, Wash	52		52			1	1,374
Tampa Bay, Fla	86	112	198	1	8	26	5,231
Total	5,738	1,257	7,271	624	152	325	407,569

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[1] A number of the smaller stations at which there were no transactions are omitted from this table.

TABLE GIVING FOREIGN, ORIENTAL, AND INSULAR STATIONS, AND TRANSACTIONS FOR FISCAL YEAR ENDED JUNE 30, 1910.

Stations.	Total number of vessels inspected.	Number of vessels fumigated.	Total number of passengers and crews inspected.
Amoy, China	51	3	8,028
Arguadilla, P. R	6	....	381
Arecibo, P. R	16	....	972
Arroyo, P. R	4	....	20
Belize, Honduras	51	....	2,428
Bluefields, Nicaragua	53	....	2,514
Bocas del Toro, Panama	137	....	6,003
Bridgetown, Barbados	169	....	10,206
Calcutta, India	56	56	4,764
Callao, Peru	130	123	16,718
Castries, St. Lucia	62	40	2,031
Cavite, P. I	30	....	5,523
Cebu, P. I	1,436	53	57,587
Ceiba, Honduras	123	....	3,735
Cienfuegos, Cuba	213	1	6,641
Coatzacoalcos, Mexico	233	33	9,721
Davao, P. I	....	....	....
Fajardo, P. R	47	1	446
Guayaquil, Ecuador	94	94	6,889
Habana, Cuba	1,055	3	94,265
Hilo, Hawaii	34	37	2,052
Hongkong, China	464	84	60,520
Honolulu, Hawaii	510	29	134,614
Humacao, P. R	12	....	121
Iloilo, P. I	332	119	22,598
Jolo, P. I	17	....	1,146
Kahului, Hawaii	13	....	314
Kobe, Japan	242	19	58,217
Koloa, Kauai, Hawaii	1	....	8
La Guaira, Venezuela	158	15	18,715
Lahaina, Maui, Hawaii	16	....	2,428
Libau, Russia	....	....	20,971
Livingston and Puerto Barrios, Guatemala	87	....	4,080
Makaweli, Hawaii	2	....	15
Mahukona, Hawaii	14	....	144
Manila, P. I	1,353	265	163,373
Matanzas, Cuba	251	....	7,406
Mayaguez, P. R	63	1	8,665
Nagasaki, Japan	104	....	57,419
Naples, Italy	303	....	177,869
Olongapo, P. I	....	....	....
Palermo, Italy	....	....	24,962
Ponce, P. R	162	15	20,772
Port Limon, Costa Rica	197	2	1,992
Progreso, Mexico	122	62	4,037
Puerto Cortez, Honduras	168	....	4,030
Salina Cruz, Mexico	67	58	3,354
San Juan, P. R	246	2	32,484
Santiago, Cuba	160	....	17,107
Shanghai, China	102	15	39,191
St. Thomas, Danish West Indies	69	4	....
Tampico, Mexico	95	18	2,755
Tela, Honduras	39	....	380
Veracruz, Mexico	118	126	12,958
Yokohama, Japan	263	....	80,191
Zamboanga, P. I	48	....	4,636
Total	9,798	1,278	1,229,396

INSULAR QUARANTINE.

OPERATIONS OF THE SERVICE IN THE PHILIPPINE ISLANDS.

Passed Asst. Surg. Victor G. Heiser, chief quarantine officer for the Philippines, holds also the position of commissioner of health under the insular government. The following is abstracted from his report of the quarantine transactions for this fiscal year:

General.—The quarantine service conducted in the Philippine Islands by officers of the United States Public Health and Marine-

Hospital Service has again fully accomplished the object for which it is organized, and, in addition, its officers have rendered a large amount of general public-health service and aid to bureaus of the insular government. This can not but have an important influence toward improving sanitary conditions in the Philippine Islands.

Not one case of quarantinable disease was imported from foreign countries, in spite of the fact that the Philippines were seriously threatened by invasion by bad outbreaks of plague and smallpox in near-by countries.

Cholera.—Cholera has been present throughout the year, and the aid rendered to the bureau of health for the Philippine Islands in successfully maintaining interisland quarantine was considerable.

Passed Asst. Surg. A. J. McLaughlin did valuable work in introducing new laboratory methods for the quick diagnosis of cholera and in preparing culture tubes which make it possible to forward satisfactory specimens from cholera stools to the laboratory by mail, even though a number of days elapse in transmission.

His work also showed that the cholera carrier in the Philippine Islands is intimately associated with outbreaks of the disease, and that methods which will be successful in eradicating cholera from the Philippine Islands must necessarily take this important factor into consideration.

The procedure for the eradication of cholera when it appears aboard ship, which is given in the United States Quarantine Regulations, proved effective in every instance.

The experience of the year has again shown that cases develop within a period of 48 hours, and that this incubation period may be accepted in the Philippine Islands as a safe quarantine standard.

Plague.—There have been no cases of plague, either in the human being or in rats, and no case was encountered at the quarantine inspection. This satisfactory condition of affairs may properly be ascribed to the fact that vessels from infected ports are regularly fumigated to destroy rats and vermin and also to the inspection which is made of all such vessels by officers of the service at the foreign ports of departure.

Considerable difficulty has been experienced during the year in enforcing regulations which would insure rats not gaining access to wharves or the shore. On account of the long absence of plague from the Philippine Islands, the fear of the disease has largely subsided, and it is most difficult to arouse officials to the importance of enforcing regulations against a danger which, to them, does not seem to be imminent.

The type of rat guard adopted by the service at San Francisco has been put into use during the year at the ports of the Philippine Islands.

The bureau of health has made regular examinations of rats and particularly from those sections of the city from which reports were received that they were dying in unusual numbers, but no plague rats were encountered at any time.

Smallpox.—With the gradual accomplishment of the vaccination of all residents of the Philippine Islands, and more especially the rigid enforcement with regard to vaccination of crews, smallpox has assumed less and less importance from a quarantine standpoint. No cases were found among the personnel of any vessel.

Leprosy.—During the year the insular government has transferred all known lepers in the Philippine Islands, with the exception of those in the Moro Province, to the leper colony at Culion, thus completing what is undoubtedly one of the largest segregations of lepers that has taken place in history.

The lepers that were collected during the year were mostly in the incipient stage of the disease, which gives promise that a marked reduction in the number of lepers in the Philippine Islands may be expected in the near future. It will be remembered that when the segregation of lepers was first commenced there were between 4,000 and 5,000 cases reported and at least 700 new infections each year. A study of recent statistics indicates that the number of new cases has already been reduced to about 300. The mortality among the lepers is very high, and as a result the total number is steadily decreasing. Official records show that there are now 2,272 lepers in the Philippine Islands. The results so far have been most encouraging. Instead of having 4,000 or 5,000 lepers roaming about at will and the incidence of the disease increasing from year to year, the total number has now been reduced to a little more than 2,000, and the disease is steadily diminishing. Even if nothing more should be accomplished, this result must stand as another great victory for modern sanitary science.

Beriberi.—During the year there have been most important developments with regard to the etiology of beriberi, and considerable evidence has become available in the Philippines which supports the polished-rice theory.

Recently the work of Fraser and Stanton in the Straits Settlements, and almost coincidentally that of Aron, of the Philippine Medical School, has shown that the outbreaks of beriberi may be caused by the continuous consumption of polished rice and that the disease is probably due to the fact that much of the phosphorus that is present in the pericarp is polished away in the milling process, and thus the human organism is deprived of the requisite amount of this element. This was experimentally confirmed in chickens, and later in human beings, by feeding polished and unpolished rice to a group of railway workers in the Straits Settlements.

The group of men that partook of the No. 1 polished white Siam rice developed beriberi within a period of approximately 60 days, while the group that used the unpolished rice remained free of the disease. Every effort was made by interchange of clothing, by contact, and by living in the same houses to convey the disease to the group that ate unpolished rice, but not a single case developed. The process was then reversed. The group that partook of the polished rice was changed to the unpolished rice, and vice versa, and within a period of approximately 60 days the group partaking of the polished rice developed beriberi. These experiments were further confirmed in Manila by using rice polishings in the treatment of beriberi patients. These showed immediate improvement in their condition, and unless the disease was too far advanced, they promptly recovered. Favorable results have also been reported by Dr. Highet, of Siam, and Dr. Haan, of Java. In view of the apparently certain evidence upon which the etiology of the disease now rests, the Governor General of the Philippine Islands has issued an executive order forbidding the use of polished rice in public institutions.

The economic value of this discovery, if it should be further confirmed, can scarcely be estimated. In Manila alone 961 deaths from this disease occurred during the last fiscal year, which, with the morbidity rate, presents a serious problem from a humanitarian standpoint, not to say anything of the financial loss, which, at a conservative estimate, amounts to at least $500,000.

During March the use of unpolished rice as the staple article of diet was begun among the 1,800 inmates of the Culion leper colony. The patients in the hospital who were actually ill with beriberi were treated with rice polishings in addition, and, unless they were too far advanced, they promptly recovered. During May the disease completely disappeared, and no cases have developed at the colony up to the close of this fiscal year. Beriberi had been almost continuously present at Culion since 1906. Previous experience had been that by reducing the amount of rice and increasing the amount of meat and mongoes (a native cereal resembling a lentil and rich in nitrogen) the incidence of the disease was greatly reduced, but it never completely disappeared.

Bills of health.—During the past few years many new factors have entered into the duty of granting bills of health in the Orient to vessels bound for the United States. A perusal of the existing quarantine laws and regulations shows that they were evidently designed for granting bills of health to vessels that start with cargo and passengers at foreign ports, and possibly call at a number of intermediate ports before reaching the United States.

With the advent of the American occupation of the Philippines conditions have to be met which can not be clearly decided from the regulations as they exist at the present time.

The foregoing conditions have caused as many different procedures to be adopted as there are officers stationed at the ports of the Orient, and much confusion has resulted among the shipping interests in consequence. Requests are received almost weekly from steamship agents to send cablegrams in behalf of vessels which they fear will have to undergo detention for not having bills of health in the form in which the officer at the port at which the vessel is to call is likely to require.

Steamship companies have shown an earnest desire to comply with all demands that have been made upon them.

In view of the importance of this matter a recommendation will shortly be made for a modification of the regulations so that they may cover these new questions that have arisen.

Foreign consulates.—The service in the Philippines is also charged with the duty of issuing bills of health for vessels bound for foreign ports and furnishing the consulates of the different nations data with regard to quarantinable diseases. This service has evidently been very satisfactory because principal consulates no longer deem it necessary to issue bills of health of their own, and have adopted the practice of viséing the bills of the service.

Outgoing quarantine.—The recent act of Congress, which provides for restricted free trade between the Philippine Islands and the United States, has already had the effect of largely increasing both the volume and the number of individual shipments of merchandise from Philippine to United States ports, and, in consequence, the work of supervising the shipment of cargo, and the treatment of personnel and their effects has greatly increased at Philippine ports. More opposition is encountered in carrying out regulations against persons or merchandise bound from one American (Philippine) port to another than from foreign ports. In order that this commercial intercourse may have the fewest restrictions placed upon it that are consistent with safety, it is deemed especially desirable that the quarantine laws and regulations be enforced without friction, delay, or annoyance to shippers and passengers. All necessary precautions have been taken in the Philippines to guard against the spread of quarantinable diseases to United States ports, and it is therefore satisfactory to report that, although hundreds of thousands of pieces of cargo and personal effects were investigated, inspected, and disinfected, many persons bathed, vaccinated, and inspected, no complaints of any kind were received.

During the year 132 vessels coming under the provisions of the United States quarantine laws and regulations governing vessels leaving foreign ports were granted consular bills of health for ports in the United States or its dependencies. Of this number 21 were partially disinfected and 27 were fumigated throughout before bills of health were issued or cargo loaded. Vessels carrying steerage passengers were disinfected, and the crews and steerage passengers bathed and their effects disinfected. All vessels proceeding to United States ports were inspected during loading and prior to sailing. Their manifests were compared with the boat notes, cargo certificates, and permits issued by the office and viséed on board prior to the completion of the bills of health. In the outgoing consular work 48,217 pieces of baggage were disinfected, 31,970 pieces inspected and passed, making a total of 80,187 pieces of baggage treated and labeled. The source, condition, and liability to convey infection of 942,258 pieces of miscellaneous cargo was investigated and the cargo certified for shipment; 1,741 pieces were disinfected prior to certification. The vast amount of difficult and exacting work entailed in the investigation and certification of such a volume of cargo and effects can only be realized by those who have had the work actually in charge.

Buildings and equipment.—It is satisfactory to report that the service in the Philippines has kept in the front rank with the advances that have been made in recent years in improved building construction.

At the Mariveles quarantine station a reenforced concrete and steel barrack building with a tile roof has been completed, and funds have become available for the construction of another at Mariveles, as well as for a disinfecting building at Iloilo. This type of construction is more sanitary than any that has yet been devised, and is ideally suited to the purpose for which it is intended. At the same time it is earthquake proof, fireproof, antproof, and not subject to the dry rot which is so destructive in tropical climates, and there is every prospect that it will last indefinitely without needing repairs.

That portion of the Mariveles Wharf upon which are located the boilers which generate steam for the disinfecting chambers was rebuilt with concrete and is apparently satisfactory, but the cost of this type of construction is so high that with the available funds only a small portion could be reconstructed.

Much repair work has been done at the Mariveles station, and the lawns and gardens developed, so that this station is probably one of the best equipped and most attractive in the service.

At Cebu additional cement water cisterns were constructed and considerable repairs and additions made. There is now an ample supply of stored rain water on hand, and the artesian well furnishes unlimited quantities for all sanitary purposes.

In brief, it may be stated that the equipment of the service in the Philippines will compare favorably with similar stations in the United States, and it is well maintained.

Immigration.—Immigration into the Philippines shows no tendency to increase, and is confined almost entirely to such Chinese as do not come under the provisions of the Chinese exclusion act. The total number of immigrants for the year was 9,532. Of this number, 6,772 were Chinese, 722 Japanese, 597 Spanish, 586 English, 201 East Indians, 181 Germans, and the remainder were scattered among all other nationalities, a notable exception being the several divisions of Austria. From the foregoing it will be seen that the type of the immigrants entering the Philippines corresponds very closely to those who enter the United States on the Pacific coast.

Since the discontinuance of the medical inspection of aliens by service officers at foreign ports of departure, the percentage of excludable diseases detected in the Philippines has greatly increased. The causes for rejection, however, are not very varied, being as follows:

Manila, 41 cases trachoma; Iloilo, 12 cases trachoma; Cebu, 4 cases trachoma.

Vaccination.—The experience of the past year was again in striking contrast to the conditions that prevailed prior to the rigid enforcement of vaccination among the crews of inter-island vessels. Formerly smallpox was frequently encountered among the crews, and delays and losses to vessels from quarantine were common. During the year only one case of smallpox occurred among the personnel of inter-island vessels.

The service in the Philippine Islands performed 4,203 vaccinations. At the Manila station 2,533 persons were vaccinated; at Iloilo, 986; at Cebu, 684. Owing to the frequency with which vaccination is done, the number of "takes" is necessarily small; still, in spite of this, 405 were recorded.

The use of the quadruplicate card system, consisting of issuing "first vaccination," "second vaccination," "third vaccination without take," and "successfully vaccinated" has been continued. Owners and agents of vessels were requested by circular and verbally to admit no persons as new members of the crews of their vessels who did not possess vaccination cards from the quarantine service. In order to facilitate this work, persons were vaccinated at the quarantine office whenever they applied. The quarantine boarding officers made frequent inspections of the crews for the purpose of ascertaining whether any unvaccinated persons were employed.

During the prevalence of smallpox along the China coast and Japan all unvaccinated passengers arriving on vessels from those places were vaccinated before being permitted to land.

Fumigation of vessels.—In order to minimize the possibility of plague being spread throughout the archipelago by vessels in the event that this disease should gain entrance to the Philippine Islands, all vessels in the interisland service and all local craft, including cascoes, launches, lighters, etc., and vessels in the foreign trade which call at ports in the Philippines, were required to be fumigated at least twice annually, in order to destroy the rats and vermin aboard. This fumigation was carried out at such times as would cause the least inconvenience to the vessels. Owners of vessels are beginning to realize more and more that rats and vermin, in addition to being a source of considerable annoyance, are also, by reason of their destructive propensities, quite an item of expense, and that it is in the interest of economical administration to have them eliminated. For this reason much cooperation was had from the shipping interests in carrying out the fumigation work. A certificate was issued to all masters of vessels who desired it stating that the particular vessel had been fumigated. This procedure also tended to popularize the fumigation, because it frequently resulted in fewer restrictions being placed upon vessels at other ports. Each vessel fumigated was provided with a blank printed in Spanish, Tagalog, and English, to be signed by the master and sent or mailed to the quarantine officer at such time after the completion of the fumigation as it was possible to have discovered all the animals that had been killed. Vessels leaving port immediately for interisland or foreign ports are instructed to mail the certificate from the first port of call. Spaces on the blank are provided for the following information: "As a result of the recent fumigation of this vessel the following vermin were killed—number of rats, number of mice, quantity of cockroaches, quantity of ants, red and white, quantity and names of other animals killed."

Vessels were required to be empty when fumigated, so that the work could be thorough, and arrangements were made so that when the unloading was completed and before new cargo was loaded the burning of the sulphur could be commenced late in the day and the compartments of the vessel left closed during the night and opened in the morning. In this way the work was expedited without annoyance or loss to shipping, and the work progressed very satisfactorily. The tropical climate greatly favors the propagation of cockroaches, ants, bugs, and other vermin, so that the physical annoyance of those traveling upon vessels is sometimes very great. Fumigation did much to eliminate this condition, so that the comfort of passengers was greatly increased, and they were duly appreciative in consequence.

During the year there were 376 vessels fumigated at the stations of the service in the Philippines—210 were fumigated at Manila, 113 at Iloilo, and 43 at Cebu. Of the 376 fumigated, 307 were interisland vessels fumigated to rid them of vermin, 21 were fumigated on account of having arrived from plague-infected ports, 27 were fumigated because they were en route for United States ports, and the remainder were fumigated on account of either human or animal diseases or insanitary conditions existing aboard.

In the work of fumigation, 4,035 rats are known to have been killed; also the following were recorded on the certificates of the masters furnished the quarantine officer after the completion of the fumigation: One hundred and forty mice, 11 bushels of cockroaches, large quantities of red and white ants, 70 tropical centipedes, and various quantities of other insects and small animals. It is believed that the above numbers do not nearly represent the total number of animals killed, because the count made was by no means accurate in many cases.

Floating equipment.—The floating equipment of the service at Manila consists of two steam launches, the *Zapote* and the *Mercury*. At Mariveles a naphtha launch, the *Nanon Dean*, has been in use during the past year; at Iloilo the steam launch *Mariveles* and the disinfecting barge *Esmeralda* are stationed; and at Cebu the steam launch *Sanidad* serves as boarding and supply boat.

These vessels have all been kept in commission during the entire year, and are in good condition, with the exception of the barge *Esmeralda*, which is not seaworthy and will not be repaired. The launch *Mariveles* was thoroughly overhauled during the early part of the year, and is now in excellent repair, with the exception of the boiler, which must be replaced by a new one.

Appropriations.—The appropriation for the general administrative expenses of the quarantine service in the Philippine Islands for the fiscal year was $62,500; the act also provided for expenditure of such amounts as were collected or refunded during the year. The refunds amounted to $2,093.98, making a total of $64,593.98 available for the expenses of the fiscal year, of which amount $7,500 was subsequently transferred, under the provisions of the appropriation act, to the fund for permanent improvements and public works, and that amount is now available until used. Two other funds for permanent improvements at the Mariveles quarantine station were also available, $5,000 for the construction of a reenforced concrete barracks, and $23,112.32 for reconstruction work on the wharf.

Expenditures.—The expenditures for the fiscal year 1910 for all purposes totaled $62,706.03. The sum of $2,355.67 was paid for repairs to the Mariveles Wharf; $3,519.65 for the construction of a concrete barracks at the Mariveles quarantine station; $32,251 for obligations of prior fiscal years; and $54,579.71 for the general administrative expenses of the service in the islands for the year. The financial transactions of the year were closed with outstanding obligations against fiscal year 1910 funds of $287.96.

Disinfecting building at Iloilo.—The maintenance of floating equipment in any climate is usually a very expensive proposition, and this is doubly true in the Tropics, where destructive agents such as white ants, teredos, dry rot, and rapid oxidation are so actively at work.

At Iloilo the extensive repairs needed to make the disinfecting barge seaworthy are scarcely justified. It is believed to be more desirable to erect a reenforced concrete disinfecting building on shore and install therein the disinfecting machinery now on the barge, and transfer the vessel to the Bureau of Navigation, which bureau can use parts of the hull in its general repair ships. The new building would house the disinfecting plants and other apparatus of the service at Iloilo, provide baths, and perhaps have one or two rooms for the detention of cases or contacts from infected vessels. A fund has been made available for the erection of such a structure, and as soon as a suitable location can be secured, plans will be prepared and the building constructed.

Contemplated improvements at Mariveles.—During the coming year, it is intended to continue the construction of reenforced concrete barracks at the Mariveles quarantine station. For this purpose $5,000 was added to the funds for public works and permanent improvements.

The maintenance of the wharf at the Mariveles quarantine station still presents a serious problem. With the small appropriation available for its repair, it is feared that satisfactory results can not be obtained. This matter is now being studied by the division of port works of the insular bureau of navigation.

Replacing the wooden piles under the bathhouse by concrete piers has proven satisfactory and will be continued during the coming year by the station employees.

Clerical work.—The office of the bureau of quarantine service for the Philippine Islands has been conducted during the year with the same number of employees as heretofore, in charge of the chief clerk. A new property-accounting and cost-keeping system, consisting of cards and ledger, was installed during the year. All property as received was charged as supplies, and when issued for use was debited to the various subheads of operation, maintenance, or equipment and credited to supplies. Each issue of property was accounted for and the cost of operation, maintenance, and equipment definitely determined.

The headquarters of the service were moved to the summer capital at Baguio for the hot season and remained there during the months of March, April, and May, with the bureaus of the insular government.

The preaudit system of accounting and the check voucher have now been in use for three years and have proven satisfactory. All obligations are paid by warrant, the same being issued by the chief quarantine officer, audited and countersigned by the auditor prior to the delivery of the warrant to the creditor.

The record index cards of incoming and outgoing correspondence have been kept up to date. Part of the work of the inspection and investigation of cargo being shipped to the United States falls on the clerical staff. The act of Congress known as the Payne bill has resulted in greatly increasing exports to the United States and in consequence has increased the number of shipments, which adds largely to the work of the service.

Vessels boarded.—There were 3,082 arriving vessels boarded, inspected, and passed during the year at the ports under the control of the service in the Philippine Islands.

Owing to the improved sanitary conditions prevailing all over the Philippine Archipelago, all incoming and outgoing inspection of interisland vessels upon arrival or prior to sailing was discontinued during the year, except for short periods, when vessels from certain infected ports were inspected. The practice of enforcing sanitary regulations aboard vessels was continued. This required many inspections while vessels were in port.

The arriving vessels which were boarded may be divided as follows: Two thousand nine hundred and five steamers and 177 sailing vessels, carrying a total of 146,575 crew and 78,595 passengers.

Interisland quarantine.—For the first time in many years general interisland quarantine was unnecessary during the entire fiscal year. During the cholera outbreak at Cebu all vessels leaving that port for other island ports were subjected to detention prior to sailing, and at

Iloilo vessels from infected island ports were required to await inspection and detention upon arrival.

On April 22, 1910, a circular was issued from all the stations of the service in the islands repealing all previous circulars with regard to the inspection and quarantine of interisland vessels. This circular discontinued bills of health for vessels engaged in the interisland trade, and stated that vessels from Philippine ports would not be required to await quarantine inspection at ports of arrival prior to landing passengers, crew, or cargo, provided the master of such a vessel agreed to await quarantine inspection in the event of any sickness having occurred upon his vessel during the voyage or that he would file at the quarantine office within an hour after his arrival in port a certificate to the effect that he had fully satisfied himself that no sickness had occurred aboard his vessel within the past five days and that his ship was in a clean and sanitary condition.

The usual surveillance over the sanitary conditions of interisland vessels was maintained. Vessels were inspected while berthed in the rivers or bays at ports of entry, which has resulted in better kept vessels each year.

A new set of regulations governing the vessels engaged in the interisland traffic is now in course of preparation by a board appointed for the purpose, and when put into effect even greater success is expected in maintaining vessels in this tropical climate in a clean and sanitary condition.

Vessels disinfected.—There were disinfected at the several stations of the service in the Philippine Islands a total of 70 vessels. Disinfection was done for the following reasons:

Six were disinfected by reason of having had cholera occur aboard, 3 vessels were disinfected on account of smallpox having developed on board, 7 vessels were disinfected on account of having transported lepers, 1 vessel was disinfected on account of a case of suspected plague being removed from the vessel after it had been given clearance at Manila, 1 vessel was disinfected on account of a suspicious death having occurred at sea, 1 transport was disinfected at the request of the United States Army on account of measles persistently recurring aboard, 11 vessels were disinfected on account of having called at infected ports en route to the islands, and 40 vessels were disinfected prior to loading cargo for the United States. Vessels were also disinfected at the request of the bureau of agriculture on account of having had diseased cattle aboard upon arrival or during the voyage.

Offices.—The offices of the service have been moved a number of times during the past year. In Manila the service now occupies a suite of rooms in the customhouse. At Iloilo, the offices were moved early in the year from the building occupied by the Quartermaster's Department of the Army to a joint occupation of an office with the surveyor of the port of Iloilo. At Cebu, the office of the service is at the quarantine station on Cauit Island. No office is maintained in the city, but telephone connection is established from Cebu to the island.

Aid to other services.—(1) Bureau of agriculture: In view of the importations of large numbers of cattle from the mainland, especially from China, Java, and Cochin China, and the prevalence of rinderpest and other cattle diseases among both the work oxen, carabaos, and the cattle imported for meat supply, this service has been cooperating actively with the bureau of agriculture in the endeavor to prevent the introduction from abroad of infected cattle or cargo. Vessels have been disinfected, hides and cattle products have been inspected and disinfected, and service officers and American consuls have been requested by this office to enforce all the regulations against hides and neat-cattle products. One of the greatest retarding factors in the progress and prosperity of the Philippines from a commercial and governmental standpoint is the lack of work animals. Thousands of square miles of the most fertile and productive lands are untilled because there are no animals available for the purpose of cultivating the soil. At the present time the efforts of the bureau of agriculture have resulted in greatly reducing the destructive animal diseases in the islands.

(2) Bureau of navigation: Physical examinations were made of officers and men to determine their fitness for promotion or for new positions in the coast-guard service; cutters and launches were disinfected and fumigated, and a general supervision has been had over the sanitary condition and equipment of the coast-guard fleet. Quarters were furnished at Mariveles for construction parties on public works under the control of the bureau of navigation. The work of the supervision of the sanitary conditions, examination of personnel, and the investigation and responsibility for the personnel, health conditions aboard the vessels of the bureau of navigation, including the water supply, sick requisites, sanitary appliances, and many other minor details of medical jurisdiction have been done by the service.

(3) Coast and geodetic survey: Upon request physical examinations of officers and men, either as applicants for positions or for promotion, were made. The vessels of the coast and geodetic survey fleet were disinfected and rid of vermin at stated intervals.

(4) Bureau of civil service: Candidates for positions requiring physical examinations were examined during the year by officers of this service. Aid was also given in examination work when so requested.

(5) Bureau of customs: An officer was detailed to aid a board appointed by the collector of customs in preparing a set of regulations for the control of the interisland shipping. By making use of one another's launches the work of the customs and the quarantine service at the different ports has been greatly expedited, and considerable sums of money saved to the Government by the lesser number of launches required.

(6) Bureau of posts: The postal authorities at the different ports of the islands are given every aid possible in effecting the prompt dispatch and delivery of the mails, especially during the trying outgoing quarantine imposed for the purpose of preventing the spread of cholera.

(7) United States Army: All the interisland transports were fumigated at regular intervals during the year; a number were disinfected on account of having communicable diseases occur on board.

Launches and lighters were disinfected and fumigated. Quarters for troops were provided at the quarantine stations for periods of from 10 days to more than a month for as many as 1,000 persons at one time; 66 persons were quarantined for the Army on account of measles, and one company of scouts on account of cholera.

(8) Board on marine examinations: All applicants for license as master, mate, pilot, or engineer of interisland vessels, including launches, are required to be physically examined when applying for their first examination and for renewal of license. These examinations, which are similar to those prescribed for officers in the Revenue-Cutter Service, were made by the officers of the service for the board on marine examinations. There were 113 examinations made, of which number 78 passed and 35 were found deficient and were rejected.

(9) Bureau of health: Constant effort was made during the year to assist the bureau of health in its endeavors to improve local sanitary conditions by assisting in vaccination, disinfection of vessels engaged in transporting lepers to the leper colony, supervising the shipment of hides and food products from port to port, and in the disinfection of vessels in the rivers and esteros upon which disease had occurred. The service officer at Cebu took an active part in the local sanitary work and the officer at Iloilo performed the duties of district health officer for the district of Iloilo, Capiz, and Antique, in addition to the quarantine work. Another officer assisted in collecting and diagnosing several hundred cases of leprosy. Vaccinations were performed at all times at the stations of the service, and hundreds of persons took advantage of this opportunity.

The supervision of shipments to the Philippine Islands of fresh meat, cold storage and chilled meat, has also been performed by the service, and our officers on duty at the foreign ports from which such shipments are made have been requested to supervise the certification of each shipment in accordance with food inspection decision No. 74, United States Department of Agriculture. The chief clerk of the bureau of quarantine service performed the duties of chief clerk of the bureau of health in addition to his other duties at Baguio during the months in which the offices of the central government were located at the summer capitol.

(10) Immigration service: The officers of the service at the several ports of entry of the Philippine Islands inspected during the year 9,506 arriving aliens in accordance with the United States Immigration Laws and Regulations.

(11) Lighthouse service: The light on Mariveles Bay for the guidance of vessels and the benefit of navigation was maintained during the year by the service as heretofore. Physical examinations of the employees of the lighthouse establishment were made by the officers of the service when requested.

(12) Weather bureau: Storm signals of the weather bureau were displayed on Mariveles Bay for the information of vessels entering or leaving Manila Bay, as well as for vessels passing up or down the Luzon coast. Mariveles Bay being a most excellent anchorage for vessels during the typhoon season, this harbor has been a real benefit to the shipping of the Orient.

Personnel.—At the beginning of the fiscal year, six commissioned and two noncommissioned officers were on detail in the Philippine Islands. One commissioned officer was recalled to the States early in the fiscal year, and no officer has been sent to take his place. Passed Asst. Surg. Victor G. Heiser continued as director of health for the Philippine Islands and Passed Asst. Surg. A. J. McLaughlin as assistant director of health.

The official personnel of the service in the islands and their different stations were as follows:

Passed Asst. Surg. Victor G. Heiser, chief quarantine officer for the Philippine Islands. Manila: Passed Asst. Surg. Victor G. Heiser, in command; Passed Asst. Surg. A. J. McLaughlin (exclusive duty with bureau of health), Passed Asst. Surg. Frank H. McKeon, Asst. Surg. Robert Olesen, pharmacist, and Chief Clerk N. C. Comfort. Mariveles: Acting Asst. Surg. Wm. J. Linley. Iloilo: Asst. Surg. J. R. Hurley. Cebu: Passed Asst. Surg. H. G. Ebert. Zamboanga: Acting Asst. Surg. Thomas J. Leary. Jolo: Acting Asst. Surg. W. F. Lewis. Olongapo: Acting Asst. Surg. James A. Randall. Cavite: Acting Asst. Surg. R. E. Ledbetter.

In addition, there are on duty 71 employees at the several quarantine stations, on the vessels of the service, and in the office of the bureau of quarantine service at Manila.

At the other ports of entry in the Philippine Islands, namely, Davao, Balabac, and Legaspi, the service has no officers stationed. Arrangements have been made with the collectors of customs to have vessels arriving at such ports directly from foreign ports inspected upon arrival by local physicians at the expense of the service.

Statistics.—Tables of statistics showing the quarantine transactions at the individual ports of the Philippine Islands, and a summary embracing the work done at all of the ports, and also a statement of the financial transactions for the fiscal year 1910, with the expenditures arranged by detail classifications and by station are submitted and follow in the order named.

SUMMARY OF QUARANTINE TRANSACTIONS, BOTH INCOMING AND OUTGOING, FOR THE PHILIPPINE ISLANDS, FISCAL YEAR ENDED JUNE 30, 1910.

	Manila.	Iloilo.	Cebu.	Cavite.	Zamboanga.	Jolo.	Total.
Vessels inspected	1,353	332	1,436	30	48	17	3,216
Vessels detained in quarantine		5	13				18
Vessels disinfected	55	6	9				70
Vessels fumigated to kill vermin	210	113	43				366
Rats killed	1,771	1,458	806				4,035
Bills of health issued	793	143	143	27			1,106
Pieces of baggage disinfected	50,166		300				50,466
Pieces of baggage inspected and passed	32,307		42				32,349
Pieces miscellaneous cargo certified	775,312	77,500	89,445				942,257
Cases quarantinable diseases detected on vessels			1				1
Persons detained in quarantine		287	439				726
Crew inspected	92,381	15,498	41,282	5,475	3,030	930	158,596
Passengers inspected	70,992	7,100	16,296	48	1,606	216	96,258
Persons vaccinated	2,533	986	684				4,203
Persons bathed and effects disinfected	11,083		106				11,189

There were no transactions at the ports of Legaspi, Balabac, Davao, or Olongapo.

Financial Statement.

GENERAL ADMINISTRATION FUNDS.

(A) *Funds prior fiscal years.*

Funds of prior fiscal years withheld for payment outstanding obligations prior to fiscal year 1910	$2,251.00
Expended during fiscal year 1910 for obligations prior fiscal years	2,251.00
Outstanding obligations	None.

(B) *Appropriation fiscal year 1910.*

Appropriation, act 1955, Philippine Islands Legislature	$62,500.00
Refunds to appropriation:	
Collections and refund credits	1,162.03
Refund from insurance fund	931.945
Total available	64,593.975
Expended during fiscal year 1910	54,579.715
Transfer to permanent improvement and public works fund, June 11, 1910	7,500.00
Authorized for new launch boiler	2,226.305
Unexpended balance to be carried to fiscal year 1911 for payment of the outstanding obligations, fiscal year 1910	287.955
Total	64,579.975
Outstanding obligations, estimated	287.95

PUBLIC WORKS AND PERMANENT IMPROVEMENTS.

1. *Reconstruction Mariveles Wharf.*

Original fund	$16,496.185
Addition, approved July 26, 1909	6,616.135
Total	23,112.32
Expended during fiscal year 1910	2,355.67
Balance on hand for work authorized Bureau of Navigation	20,756.65
Total	23,112.32

2. *Mariveles barracks.*

Fund authorized June 24, 1909	5,000.00
Expended during fiscal year 1910	3,519.645
Balance available for finishing the building now being constructed	1,480.355
Total	5,000.00
Outstanding obligations	64.44

Total expenditures:	
From funds of prior fiscal years	2,251.00
From funds of fiscal year 1910	54,579.715
For reconstruction Mariveles wharf	2,355.67
For Mariveles barracks	3,519.645
Total expenditures	62,706.03

Distribution of expenditures.

Compensation of personnel	38,546.705
Office and general service expenses	1,946.35
Launch and barge expenses	7,600.515
Station supplies and disinfectants	4,989.835
Repairs to buildings and wharfs	4,357.785
New construction and new equipment	5,264.84
Total expenditures	62,706.03

Expenditures by station.

Manila:		
General service expenses	$17,786.60	
Launch expenses	6,681.90	
New station equipment	101.345	
		24,569,845
Mariveles:		
General service expenses	11,457.21	
Launch expenses	268.50	
Repairs to buildings and wharfs	3,647.145	
New construction and equipment	4,681.665	
		20,054.52
Iloilo:		
General service expenses	2,987.685	
Launch and barge expenses	4,724.915	
New station equipment	45.585	
		7,758.185
Cebu:		
General service expenses	5,494.23	
Launch expenses	2,989.15	
Repairs to buildings and wharfs	780.575	
New construction and equipment	449.525	
		9,713.48
Zamboanga:		
General service expenses		400.00
Jolo:		
General service expenses		210.00
		62,706.03

OPERATIONS OF THE SERVICE IN HAWAII.

Passed Asst. Surg. Carl Ramus was detailed as chief quarantine officer of the Territory of Hawaii on May 23, 1910, vice Passed Asst. Surg. Wm. C. Hobdy, who resigned from the service May 31, 1910, having been on leave since January 31, 1910.

The following transactions for this fiscal year are abstracted from the report of Passed Asst. Surg. Ramus:

> The work of the service in Hawaii is divided into four heads: First, quarantine operations; second, plague-preventive measures; third, immigration inspection; fourth, marine-hospital relief. Only the quarantine operations and plague-preventive measures will be reported under this heading, the subjects of immigration and marine-hospital relief in Hawaii being treated of elsewhere in this report.

QUARANTINE OPERATIONS.

The quarantine operations at Honolulu were as follows:

Vessels inspected	510
Vessels disinfected	29
Passengers and crew inspected	134,614
Persons detained in quarantine for observation	1,448
Persons treated for quarantinable disease	24
Pieces of baggage disinfected	7,817
Persons treated for board of health	800
Hides disinfected	98,071

The United States Quarantine Laws and Regulations were enforced by officers of the service at seven subports of entry in the Hawaiian Islands in addition to Honolulu.

At Honolulu the service has a first-class quarantine and disinfecting station with a wharf capable of accommodating vessels of 35-foot draft. The quarantine station has accommodations for 600 steerage and 75 cabin passengers. In addition there are tent platforms of United States Army regulation 14 by 15 size, which can be made available for 1,280 soldiers at short notice, with the cooperation of the Quartermaster's Department of the United States Army.

Thus it would be possible in a great emergency for the service at Honolulu to handle 1,955 persons in quarantine barracks. In addition there is practically unlimited tentage capacity.

At Hilo the service maintains a second-class disinfecting station with facilities for fumigating large steamers by the sulphur-pot method. There is as yet no provision for handling numbers of persons in quarantine except on shipboard. Steam disinfection of bedding and baggage is done through the cooperation of the board of health.

Arrival of infected vessels.—Ten vessels arriving at Honolulu during the fiscal year were actually infected, or had recently been infected. They will be briefly referred to in chronological order:

The Pacific mail steamer *Korea* arrived July 20, 1909, from the Orient, having a case suspicious of plague in the steerage. The steerage passengers for Honolulu were held at the quarantine station seven days, and the usual disinfection was performed. Organisms resembling the bacillus of plague were found at first, but subsequent tests were negative.

The United States armored cruiser *Washington* arrived January 31, 1910, from Yokohama with two cases of smallpox in the crew. The *Washington* came in several hours ahead of the seven other vessels of the Pacific fleet, and was taken at once to the quarantine wharf. Both smallpox cases and two Hospital Corps nurses were transferred to one of the isolation wards at the quarantine station. One case was of the confluent type and died soon after removal. The surviving case was held until recovery. These cases had been isolated on shipboard from the first day of sickness, and the senior medical officer had taken all precautions at sea. Consequently the quarantine period at Honolulu was reckoned from the day of isolation at sea. Two Hospital Corps men who had attended the smallpox cases were returned to the *Washington* by request of the commanding officer when the fleet sailed February 8, with the understanding that they were to be isolated the required number of days.

While en route from Honolulu to Seattle five cases of smallpox developed. Although the medical officers of the *Washington* have cooperated with the service in every possible way, the cause for the recurrence of smallpox after so long an interval has not been determined.

The steamer *Makura* arrived February 2 from Australian ports with a case of smallpox among the steerage. The case came from the vicinity of Brisbane. Because the case had not been properly isolated, it was necessary to quarantine the second cabin as well as the steerage passengers for 14 days. The vessel was held at the quarantine wharf while in port, and sailed on the fifteenth day for Vancouver. No new cases developed in quarantine.

The Japanese steamer *Tamon Maru* arrived March 7 from Moji, Japan, via Ocean and Pleasant Islands. There had been a death at sea on March 3 which, from the description given, seemed highly suspicious of cholera. The body had been thrown overboard. Another seaman was suffering from diarrhea and two others fell sick on the morning of arrival. Smears from the discharges of one of the cases showed curved bacilli which were considered suspicious. The three sick men were removed to the quarantine station and the ship disinfected. The personnel were kept on board, and the ship held at anchor well outside the harbor. Culture tests were at first suspicious, but later seemed negative. In view of the possibility of cholera the vessel was held the full five days. The three sick cases recovered.

The Pacific Mail steamer *Mongolia* arrived April 8 from the Orient with a case of smallpox in a Chinese steerage passenger. The case had been properly isolated at sea and all vaccinated. The *Mongolia* was taken at once to the quarantine wharf. The patient was taken to an isolation ward on the quarantine station. Three hundred and ninety-six steerage passengers and their effects and a large amount of bedding were transferred to the wharf for disinfection. The infected quarters of the steamer were disinfected. The steerage passengers were held overnight at the quarantine station. In the morning those bound for San Francisco were put on board. The *Mongolia* sailed in the afternoon with a letter informing the quarantine officer at San Francisco of the action taken. No new cases developed in quarantine.

The U. S. S. *Albatross* arrived April 15 from Yokohama with a case of smallpox in a white seaman. There was also a Filipino seaman having a suspicious skin eruption. Both cases were taken to the isolation wards. The vessel was disinfected at the quarantine wharf, and afterwards held in quarantine at anchor in the stream. All on board were vaccinated by the navy surgeon. The *Albatross* departed for San Francisco flying the yellow flag. No new cases developed.

The Pacific Mail steamer *Asia* arrived April 23 from the Orient with a history of two cases of smallpox between Hongkong and Yokohama. Disinfection had been done both at Nagasaki and Yokohama. The steerage passengers for Honolulu were detained at quarantine for 14 days from the date of disinfection at Yokohama. On April 25 two cases of suspicious skin eruption developed among the Filipinos. On April 27 a third case was found. On account of the dark color of the Filipinos a diagnosis of chicken pox in all three cases could not be reached until April 28.

The Pacific Mail steamer *Mongolia* arrived May 7 from the Orient with three cases of chicken pox and one case suspicious of smallpox and a history of two cases of smallpox before arrival at Nagasaki and one between Nagasaki and Yokohama. All were Filipinos. Disinfection at both ports was certified to by service officers. The steerage passengers for Honolulu were taken to the quarantine station to complete the 14 days from the disinfection at Yokohama and pending diagnosis in the doubtful case, which was later diagnosed chicken pox. There were also several cases suspicious of diphtheria. No new cases developed, and all were released May 10.

The Japanese steamer *Nippon Maru* arrived June 3 from the Orient with 233 steerage passengers for Honolulu, including 121 Russians. The Russians had been held in quarantine seven days at Kobe and their effects disinfected prior to embarkation. On June 7 three cases of plague were found at the immigration station, all in Russians from the *Nippon Maru.* With the assistance of the board of health, all the Russian and Filipino contacts were apprehended and taken at once to the quarantine station. The 3 plague cases and 19 other contacts at the immigration station were removed to the quarantine station. The detention period in this case was extended to nine days. No new cases developed and all contacts were released. One plague case died June 11. The others recovered.

Outgoing quarantine.—The port of Honolulu having been clean during the entire year, except for the finding of one plague-infected rat at Aiea, 9 miles distant, no outgoing quarantine measures were imposed other than those always in force at Honolulu, namely:

1. Certification of all freight bound for coast ports of the United States.
2. Disinfection of hides, wool, and certain other animal substances bound for the mainland.
3. Occasional fumigation of interisland vessels to kill rats.
4. Exclusion of rags and other junk coming from unsanitary districts or that might have been in contact with leprosy.

An outgoing quarantine was imposed at Hilo and ports on the island of Hawaii from March 19 to May 14 on account of plague, which had appeared simultaneously at Hilo and Honakaa, the latter a place more than 60 miles distant from Hilo. The outgoing quarantine was made to apply to vessels plying between Hilo and other ports of the Hawaiian Islands, as well as to vessels bound for United States coast ports. During the year 26 vessels leaving Hilo were inspected and cleared; 37 were disinfected and cleared; 543 members of crews were inspected and passed; 742 passengers were examined and passed; 540 pieces of baggage were disinfected; and 700 pieces of baggage were inspected and passed.

The fumigation of vessels leaving Hilo for Mexican ports is being done by request of the Mexican Government.

The land operations at Hilo and Honakaa in stamping out plague at those ports were conducted by the Territorial board of health. The board of health and the service cooperated in the disinfection of baggage and inspection of passengers from the various ports of the island of Hawaii bound for the other islands.

The total number of cases of plague during this outbreak was six—four at Hilo and two at Honokaa. In addition there were four cases of probable plague—two at Hilo and two at Honokaa. These cases all recovered and the clinical signs could not be confirmed by bacteriologic tests.

Owing to the occasional finding of plague-infected rats in and near Hilo for several years past all interisland vessels and vessels bound for the Pacific coast are required at all times to observe rat precautions and to use rat guards on all lines while alongside the wharf at Hilo.

Diphtheria epidemic among Russian immigrants.—On February 21, 1910, the chief quarantine officer at Honolulu was summoned to a conference held at the office of the governor of Hawaii to decide on measures to be taken in reference to an outbreak of diphtheria among a large number of Russian immigrants quartered at the barracks of the Hawaiian Territorial Immigration Board. The resources of the Territorial board of health were then severely strained on account of diphtheria in Honolulu. On the recommendation of the president of the board of health request was made by the governor that the service take charge of the situation, without expense to itself, in the matter of the Russians. Consent was given and 315 Russians were taken to the United States quarantine wharf. They were bathed, their effects disinfected, and then quartered in the oriental barracks at the quarantine station.

On February 25 the Japanese steamer *Tenyo Maru* arrived from the Orient with 70 Russians having diphtheria amongst them. At the request of the governor these Russians were also taken to the quarantine station for disinfection and detention.

No new cases having developed in quarantine by March 1, all were released with the consent of the board of health.

After their release from quarantine station the Russians camped on the water front at Honolulu, refusing to go to work on the plantations because of a misunderstanding having arisen as to the wages they would receive. Many other dissatisfied Russians joined the camp. In a few days their camp became extremely insanitary and there was much suffering among the women and children from lack of food. On March 4 a number of cases of diphtheria were found by the board of health physicians. There was free communication between the Russian camp and the city. A serious epidemic of diphtheria threatened Honolulu. After consultation, request was made of the service by the governor and the president of the board of health that the Russians be again taken to the quarantine station for detention and disinfection, the board of health to furnish physicians, nurses, and guards. Consent was given, and the entire camp was transferred to the quarantine station.

On March 7 the steamer *Korea* arrived from the Orient with 249 Russians with 32 cases of diphtheria. The Russians were taken first to the immigration station at the request of the inspector in charge, and on March 9 to the quarantine station, by request of the governor and the president of the board of health. To properly guard the camp and maintain discipline the hospital corps of the Hawaii National Guard and 50 uniformed guardsmen were detailed on quarantine island.

On March 25 the steamer *Siberia* arrived from the Orient with 213 Russians and 1 case of diphtheria. At the request of the governor of Hawaii they were taken to the quarantine station.

The upper portion of the quarantine station, with the buildings thereon, was used by the Territorial board of health from March 5 to April 7, 1910. Nearly 100 cases of diphtheria occurred. An enormous amount of baggage was disinfected. The mortality rate was very low.

Acting Asst. Surg. A. N. Sinclair, of the service, was in charge of the camp, by the request of the governor.

PLAGUE-PREVENTIVE MEASURES.

Plague laboratory.—The measures instituted by the Territorial board of health throughout the islands with the cooperation of the service for the prevention of plague have grown more and more in scope and importance until at present the demands made on the United States plague laboratory at Honolulu are very pressing. Large numbers of rats are brought in daily. Smears are made from the tissues of every rat, whether apparently well or not. When rats are found dead, not from injuries, much more work is involved. Several slides are carefully examined, and culture tubes and a guinea pig or mongoose inoculated. The finding of a plague-infected rat or of a positive or suspicious human case always greatly increases the routine work of the laboratory for some time afterwards, because of the extra sanitary precautions then taken by the board of health in the way of general policing and the consequent daily increase in the rat catch.

One of the most satisfactory results of the rat campaign in Honolulu is the education of the general public and its hearty and intelligent cooperation with the service and board of health in the extermination of rats. When houses become infested with rats, the occupants call or telephone the quarantine office, and the next day a rat-catcher is sent to the house with a number of traps. Whenever dead rats are found by laymen they almost invariably telephone the fact to the quarantine office, and a laboratory assistant is sent at once to secure the rat and disinfect the place where it lay. There is no longer any mystery to the people of Honolulu as to the source of plague infection. All residents of average intelligence and education now know that plague is carried by rats. Realizing this they each and all do what they can to destroy these rodents. There could hardly be a better and more convincing demonstration of the value of public education along hygienic lines than this active cooperation of the people with the board of health officials and service officers in the rat crusade at Honolulu.

During the epidemic of diphtheria referred to among the Russian immigrants some of the work of inoculating culture tubes from throat swabs was conducted in the United States plague laboratory.

When infected or suspicious vessels arrive the resources of the laboratory often prove of great value to the quarantine branch of the service. When the Japanese steamer *Tamon Maru*, previously referred to, arrived with cases suspicious of cholera, valuable assistance was given by Dr. Walter R. Brinckerhoff, the then assistant director of the service leprosy investigation station.

Assistance to the board of health and to local physicians is often rendered in making laboratory tests for typhoid fever.

The guinea pigs used in the laboratory are raised at the quarantine station. A large pen is provided for them and it is possible to produce them in almost any number desired. Several pairs of guinea pigs were sent, on request, to the naval station at Guam.

Probably the most important work undertaken in the plague laboratory during the fiscal year is that now in progress to determine the part played in the spread of plague infection by the mongoose. These experiments were first undertaken at the request of Dr. J. S. B. Pratt, of the board of health, as a result of observations made by him that the mongoose seemed to disappear from a locality prior to an outbreak of human plague. During the previous fiscal year efforts made by Passed Asst. Surg. William C. Hobdy to infect the mongoose with plague were unsuccessful. When Pharmacist J. E. Beck succeeded in infecting the first mongoose in this laboratory the peculiarities of the case proved a genuine surprise. The mongoose was inoculated by the dermic method used with guinea pigs. The material used was spleen from a guinea pig that died of plague from inoculation from a case of human plague from the steamer *Nippon Maru*. On account of the extreme ferocity of the mongoose it had to be chloroformed before being inoculated. Death occurred in about 18 hours, and it was at first thought to have been caused by the chloroform. However, the routine examination of the viscera was made and plague bacilli were found in the spleen. The second mongoose inoculated died in 3 days of septicæmic plague. The third mongoose inoculated lived 13 days. Smears from its tissues were not positive, but a guinea pig was inoculated and died of plague.

This work is not entirely original, a few cases of mongoose infection with plague having been reported by Simpson in 1905. But this is the first time, as far as is known, that the mongoose has been shown to be a possible, if not a probable, plague carrier.

The officials of the board of health at Honolulu regard this demonstration as very important and timely, owing to the prevalence of the mongoose throughout the Hawaiian Islands. Its influence on future insular quarantine and plague-prevention measures may be considerable.

Summary of transactions at plague laboratory at Honolulu.

Total number of rat catchers paid by board of health to deliver rats to this laboratory	12
Total rats and mongoose received at this laboratory	32,116
Trapped	21,640
Found dead	25
Shot from trees	1,478
Killed by sulphur dioxide	268
Examined bacteriologically	24,818
Showing pest infection	1
Human cases examined bacteriologically	5
Showing pest infection	3
Animals inoculated to confirm diagnosis	14

Classification of rats trapped:	
Mus alexandrinus	3,581
Mus musculus	12,507
Mus norvegicus	4,510
Mus rattus	10,374
Pest infected	1
Classification of rats found dead:	
Mus alexandrinus	4
Mus musculus	4
Mus norvegicus	4
Mus rattus	13
Pest infected	0
Classification of rats shot from trees:	
Mus alexandrinus	431
Mus musculus	3
Mus rattus	857
Pest infected	0
Classification of rats killed by sulphur dioxide:	
Mus alexandrinus	69
Mus musculus	5
Mus norvegicus	1
Mus rattus	189
Pest infected	0
Hilo cases referred to this laboratory for verification:	
Rat cases	36
Human cases	11
Rat cases proven	13
Human cases proven	10
Animals inoculated to confirm diagnosis	47

INCOMING QUARANTINE TRANSACTIONS AT SUBPORTS, FISCAL YEAR ENDED JUNE 30, 1910.

	Hilo.	Mahukona.	Kahului.	Lahaina.	Koloa.	Port Allen.
Vessels inspected	34	14	14	16	1	2
Vessels disinfected	37					
Baggage disinfected	540					
Baggage inspected	700					
Passengers inspected	871		2	1,436		2
Crew inspected	1,181	144	314	992	8	13
Vessels cleared	26					

QUARANTINE IN PORTO RICO.

The chief quarantine officer for Porto Rico, Passed Asst. Surg. S. B. Grubbs, stationed at San Juan, reports for the fiscal year ended June 30, 1910, in substance as follows:

The headquarters for the quarantine service in Porto Rico are at San Juan, the other stations or subports being Ponce, Mayaguez, Fajardo, Humacao, Arecibo, Aguadilla, and Arroyo.

The operations at all of these ports are under the general supervision of the chief quarantine officer at San Juan.

On account of the presence of both plague and yellow fever in Venezuela during the fiscal year, the utmost care has been observed at the various Porto Rican ports in the treatment of vessels arriving from La Guaira and Puerto Cabello, ports in Venezuela, only two days distant in time from the various Porto Rican ports.

The presence of a representative of the service in La Guaira, Venezuela, who enforced the quarantine regulations for foreign ports upon vessels destined to Porto Rico, was productive of much benefit in minimizing the quarantine restrictions at the ports in the latter country.

SUMMARY OF TRANSACTIONS.

Quarantine service at San Juan, Porto Rico, during the year ending June 30, 1910.

Vessels inspected	246
Vesels held in quarantine	43
Vessels disinfected	2
Passengers inspected	17,809
Passengers detained	332
Crew inspected	14,676
Bills of health issued	231

Transactions at the subports in Porto Rico.

Ponce:	
Vessels inspected	162
Vessels in quarantine	31
Vesels disinfected	15
Passengers inspected	12,406
Crew inspected	8,366
Passengers detained in quarantine	50
Bills of health issued	198
Mayaguez:	
Vessels inspected	63
Vessels held in quarantine	3
Vessels disinfected	1
Passengers inspected	5,172
Crew inspected	3,493
Bills of health issued	31
Fajardo:	
Vessels inspected	47
Vessels disinfected	1
Passengers inspected	99
Crew inspected	347
Bills of health issued	39
Aguadilla:	
Vessels inspected	6
Passengers inspected	130
Crew inspected	251
Bills of health issued	14
Arecibo:	
Vessels inspected	16
Passengers inspected	272
Crew inspected	700
Bills of health issued	13
Arroyo:	
Vessels inspected	4
Crew inspected	20
Bills of health issued	34
Humacao:	
Vessels inspected	12
Crew inspected	120
Bills of health issued	21

FOREIGN QUARANTINE.

The duties of officers of the Public Health and Marine-Hospital Service detailed at foreign ports are as follows:

First. The investigation into the previous whereabouts and the past and present sanitary history of all vessels destined for ports in the United States, its possessions, and dependencies.

Second. The inspection of vessels, crews, and passengers, and the certification of freight.

Third. The fumigation of ships to kill rats and mosquitoes, or the disinfection of ships when necessary.

Fourth. The observation, if necessary, under detention, of intending passengers for ports in the United States and its dependencies.

Fifth. Weekly reports of transactions.

Sixth. Weekly reports as to the health and sanitary conditions of the foreign port, and when possible of the country contiguous thereto.

Seventh. The certification, in conjunction with the United States consular officers, of the bills of health issued, said certificates to be made just prior to the departure of the ship and to cover all requirements provided for by the United States quarantine regulations.

FRUIT PORT INSPECTION SERVICE.

Acting assistant surgeons were detailed in accordance with custom to enforce at certain foreign fruit ports the quarantine regulations relating to fruit vessels, which permit the entry of such vessels to ports in the United States without detention at quarantine stations.

The reports from the officers at the several stations follow:

BELIZE, BRITISH HONDURAS.

Acting Asst. Surg. C. L. Mengis reports as follows:

Season of 1909 (July 1 to Oct. 31). Fifty steamers and 1 sailing vessel were inspected. There were 1,907 crew and 486 passengers on steamers, and 35 crew on sailing vessel. During this period health conditions were reported as good.

During the season of 1910 this station was closed.

BOCAS DEL TORO, PANAMA.

Acting Asst. Surg. Paul Osterhout reports as follows:

Season of 1909 (July 1 to Oct. 31). Seventy-eight vessels, with 3,105 crew and 78 passengers, were inspected.

No infectious or contagious diseases appeared in this port during the year.

The general health conditions of the town and the surrounding territory have been good.

Season of 1910 (Apr. 28 to June 30). Fifty-five vessels, with 2,735 crew and 85 passengers, were inspected. The general health conditions were good during this period.

BLUEFIELDS, NICARAGUA.

Acting Asst. Surg. T. B. L. Layton reports as follows:

Season of 1909 (July 1 to Nov. 30). Twenty-nine steamers, with 1,148 crew and 187 passengers, were inspected. On account of local conditions at Bluefields, Dr. Layton was directed to remain there until November 30, 1909. The following extracts are taken from his report:

With the outbreak of the revolution the local population increased from 2,500 to several thousand more. The garrison in Bluefields was strengthened by 500 additional troops. More than 2,000 exiles from Central American Republics, the West Indies, and the United States have arrived since last October.

The general health during the past five months has been good.

There have been no cases of infectious disease here or in the vicinity, this in spite of the fact that men from everywhere have landed here unhindered.

Acting Asst. Surg. Allen Jumel, jr., reports as follows:

Season of 1910 (two months ending June 30). Twenty-four vessels, with 1,044 crew and 135 passengers, were inspected.

Bluefields Harbor is formed by the Escondido River, a large navigable stream, which runs along the inner shore of a narrow peninsula, and finally empties into the sea, after curving around an elevated promontory called the Bluff. All vessels during times of peace and when coastal territory is under the immediate control of the Bluefields faction moor alongside the Bluff, and discharge cargo, after which they either come to anchor in the river near the Bluff or proceed up the river and load tropical fruit at various points of call. After taking cargo, these vessels return to the Bluff, where they are boarded, inspected, and cleared for ports in the United States, direct or via other ports. Upon arrival, masters are required to submit crew lists to the service officer, stating the health conditions on board. Masters or their representatives are given shore leave to attend to business matters immediately connected with their respective vessels. Other members of the crew are not permitted to leave their vessels. The boarding of vessels is done at all hours, usually during the daytime, in a small motor boat. Since the capture of the Bluff by the Madriz forces vessels have been cleared at or near Schooner Cay, a small island in the Escondido River about 12 miles from Bluefields. Small vessels inspected and cleared for points in the Republic of Panama are usually cleared at the wharf in Bluefields.

Sanitary conditions.—The sanitary conditions at the port were not good, and although this was recognized by the local health officer, his efforts to better the conditions met little or no encouragement until June 6, 1910, when, as the result of joint action on the part of Surg. Gen. Sequiera, of the provisional army; Maj. S. D. Butler, of the United States Marine Corps; Surg. C. W. Smith, of the U. S. S. *Dubuque*, and the service officer, the following sanitary regulations were promulgated:

SANITARY ORDER.

BLUEFIELDS, NICARAGUA, *June 6, 1910.*

For the preservation of the health of the United States citizens and troops now quartered in Bluefields, Nicaragua, and for the general good of the public, it becomes necessary to issue and enforce the following sanitary regulations:

1. Each person occupying a house is required to keep this house and its grounds and outbuildings clean. All garbage and trash is to be either burned or buried. Garbage which is buried must be at least 2 feet under ground. Grounds must be drained so that no pools of stagnant water can collect. All tanks holding water must be screened or destroyed.

2. Special care must be taken of water-closets. Water-closets must be kept clean and dry, and so arranged that no rain water will wash under them and carry impurities away. Water-closets must be covered over each day with a layer of earth about 2 inches deep. When a closet is within 2 feet of being filled it must be either completely covered with earth or a new closet dug, or it must be cleaned out and disinfected and its contents either burned or buried at least 2 feet under ground. Any person who occupies a house and does not do his utmost to comply with the foregoing regulations will be arrested and fined or otherwise punished.

Special sanitary order for the market.—Each room in the market must be cleaned out every day and kept clean all day. Persons having rooms must keep the hallway and outside gallery clean around their rooms. No person is permitted to sleep in any room in the market. No rotten meat, fruit, vegetables, and other foods can be sold or kept in the market. Frequent inspections will be made by sanitary officials, who will prescribe additional sanitary methods. Pigs must be kept confined. Owners of dogs must keep them confined, as all stray dogs will be killed.

L. SEQUIERA, M. D.,
City Health Officer.

It is my opinion that the foregoing rules and regulations for local sanitary improvement are urgently necessary, and are immediately required to relieve the negligible sanitary conditions prevailing in this port.

ALLEN JUMEL, Jr.,
Acting Assistant Surgeon,
United States Public Health and Marine-Hospital Service.

The enforcement of the foregoing rules and regulations is considered essential for the maintenance of the general health of the United States troops stationed ashore.

C. W. SMITH,
Assistant Surgeon, United States Navy,
Senior Medical Officer Present on Shore.

The foregoing regulations being for the good of the whole community and a necessity for the health of the American forces here stationed, are approved, and the force under my command will render all possible assistance toward enforcing them.

S. D. BUTLER,
Major, United States Marine Corps, Commanding Officer.

To effect the needed sanitary improvements, details from the military prison were furnished by the provisional government, and put to work under the supervision of officers and men of the United States Marine Corps. The military prison was cleaned, its yards and outhouses put into good sanitary condition, and good drainage effected. The local hospitals were improved by the removal of filth and other accumulated débris, and placed in the proper condition for the treatment of indigent sick and wounded soldiers. Unsanitary water-closets were made sanitary, and the streets were graded and drained.

No quarantinable diseases were reported during the period ending June 30, 1910.

Tuberculosis is reported prevalent in and around Bluefields. The malarial fevers, especially the æstivo-autumnal type, are of frequent occurrence. Simple dysentery and uncinariasis are commonly observed.

CEIBA, HONDURAS.

Acting Asst. Surg. Allen J. Jumel reports as follows:

Season of 1909 (July 1 to Oct. 31). Sixty-four vessels, with 1,539 crew and 177 passengers, were inspected. No vessels were fumigated.

Ceiba is cleaner than ever before. This is due, in part, to the energy exerted by Gov. M. Rivas, who appears to be indefatigable in his endeavor to keep the town clean. There is a movement on foot to establish a water-supply system in Ceiba, the object of the promoters being to pipe water into the town from the Danto River, a splendid mountain stream several miles from the town limits. Considerable work is being done in road construction, and in the reparation of surface drains.

Malarial fevers are endemic, with the milder intermittent types predominant. Simple dysentery is commonly observed and amebic dysentery occasionally. Various gastroenteric disorders due to dietetic imprudences are common. Tuberculosis is present, and also trachoma, which appears to be spreading among the Syrians.

Acting Asst. Surg. T. B. L. Layton reports as follows:

Season of 1910 (Apr. 9 to June 30, 1910). Forty-nine vessels, with 991 crew and 1,028 passengers, were inspected.

Ceiba is the chief seaport on the Atlantic side of Spanish Honduras, the capital of the Department of Atlanticla and a town of some 6,000 population. It occupies an area not half a mile wide, by scarcely a mile in depth. The Caribbean Sea forms its northern boundary; a stretch of swamps—with a mountain range beyond—shuts it in on the south. The northern or sea half of the port is rather flat, just a little above sea level. The southern portion is much lower and very uneven. Up to 1906 the entire town was much below high tide and only protected from the inrush of the sea by a high sandy beach. In the year just mentioned an attempt was made to elevate by a few feet the level of the city. The work was undertaken by the municipal authorities and sand was used as a filling. All efforts ceased after about one-half of the port (the sea half) had been raised to its present height. What has since become the business section and chief residential district to-day presents a fairly well drained area, with rather good streets. Beyond this improved portion nothing has been done and no drainage exists. The chief thoroughfares while not actually paved, answer all practical purposes. In the past, sidewalk construction was left entirely to the property holder. While many of the foreign residents paved narrow strips in front of their stores and homes, a great many more failed to follow the example set. There is not at this writing in the entire port an unbroken stretch of sidewalk 100 feet in length. To remedy this condition the municipality is just now contemplating the passage of an ordinance to compel the construction of pavements.

Beyond the collection of garbage several times during the week and the cleaning of the principal streets, the city government pays little attention to sanitation. The laws enacted some years ago to compel the screening of tanks and the oiling of other containers (natural or artificial) have fallen into disuse.

The all-important local question is that of an adequate and wholesome water supply. The annual precipitation is the chief source, and always proves inadequate. A famine invariably results shortly after the rains cease. Wells, mere holes in the ground (of which, unfortunately, there are a superabundance), become the only source of supply for the greater majority of the inhabitants. The local ice factory, to all daily purchasers of ice, furnishes free distilled water in ample quantity to satisfy the daily wants. To the native unable to buy ice this privilege is denied.

Dysentery is prevalent during the period of drought. Wells and closet vaults are always in close proximity; therefore water from the former is frequently contaminated, and simple dysentery prevails among the poorer classes.

With mosquitoes so plentiful, mostly anopheles and culex, malaria is the most common of the diseases. During the period under report only the milder types of malaria have been encountered. Tuberculosis contributes largely to the annual death rate and is second only in fatality to amebic dysentery. Gastro-intestinal disorders are frequently observed, more commonly among children and usually during the mango, pineapple, and alligator pear seasons.

The average number of deaths per month from all causes, out of a population of about 6,000, is 8 or 10. As the register of deaths is very imperfectly kept, these figures are subject to interrogation. No quarantinable disease has appeared in Ceiba and vicinity since 1907, when there occurred a single case of yellow fever.

Ceiba is not in advance of any other Central American port, though it may be the equal of a few of the least advanced. Steamer communication between Ceiba and foreign countries is carried on by three companies: The Vaccaro Bros. and the Oteri lines from New Orleans, and the Hubbard-Zemmway line from Mobile. By sailing vessels the West Indies, the neighboring republics, and the outlying islands can be reached. The steamship lines are all engaged in the fruit trade. Coast points, in Honduras only, can also be reached twice each week by fruit steamers.

Since the opening of the season the Vaccaro Bros. & Co. have completed the construction of a wharf projecting into the sea 900 feet. Their own vessels, since May 13 last, have been loading and discharging cargoes alongside. Steamers of the other two companies anchor about three-fourths of a mile off shore, here and at coast points, loading from and discharging into lighters.

LIVINGSTON AND PUERTO BARRIOS, GUATEMALA.

Acting Asst. Surg. R. P. Ames reports as follows:

Season of 1909 (July 1 to October 31): Fifty-two vessels, with 1,894 crew and 551 passengers, were inspected.

Frequent inspections were made of the numerous towns and fincas along the line of the Guatemala Railway, including several visits to Guatemala City and one to San Jose, the most important port on the Pacific coast.

Sanitary conditions.—The sanitary and health conditions of Guatemala City are excellent. The streets are well paved and lighted and the city has a good sewer system and water supply, the latter being piped from a mountain stream. The city is also supplied with a crematory and all of the modern municipal conveniences. The climate is delightful, the altitude being 4,878 feet. Among the many public institutions located in the city there is a general hospital with a capacity of 510 beds. This is under the direction of the Government and is managed by the Sisters of Charity. The hospital is always crowded, owing to the fact that the sick come from all parts of the Republic, and quite often from Spanish Honduras.

Yellow fever.—The towns of Zacapa and Chiquimula and the adjacent territory of Spanish Honduras were visited in 1905 by an epidemic of yellow fever with high mortality. Occasional cases and deaths have occurred since this epidemic. From what can be learned no special measures were instituted in the way of fumigation for the destruction of mosquitoes, nor for the oiling of water containers for the killing of mosquito larvæ.

Under these conditions and in that latitude this territory may be looked upon with some suspicion. Passengers from Zacapa were required to pass the full incubation period of yellow fever under observation at Puerto Barrios before being granted the service certificate.

It is reported that an American consulate will be established at Zacapa, and will be an important source of reliable information concerning the sanitary condition of that place.

The health and sanitation of Livingston and Puerto Barrios.—These have been very satisfactory during the period. The rainy season commences in July and continues until January. Dysentery, pneumonia, and malarial fever, mostly of the quotidian type, are the prevailing diseases. Sanitary improvements on a very extensive scale are proposed by the united fruit and railway companies. Their plans are to raise or fill in certain lowlands to a height of 3½ feet above sea level, and to build a substantial sea wall at Puerto Barrios. The civil engineers estimate that the work will cost about $2,500,000 gold. Certain concessions are pending between the companies and the Government of Guatemala, and upon the granting of these the work will commence.

The stegomyia calopus, anopheles, and culex pungens mosquitoes are found on the Atlantic and Pacific coasts, and also some distance inland along the line of the railways.

A few cases of smallpox exist at remote interior towns, but vaccination is practiced generally and all cases are under observation and control.

Season of 1910 (April 23 to June 30): Thirty-five vessels with 1,452 crew and 183 passengers were inspected. The sanitary condition of the port during this period, so far as the occurrence of quarantinable diseases is concerned, was reported to be good.

PORT LIMON, COSTA RICA.

Acting Asst. Surg. William H. Harris reports as follows: Season of 1909 (July 1 to October 31). One hundred and thirty steamers with their crews and passengers were inspected, and the temperatures of crew and passengers taken.

During this period the port has been entirely free of any quarantinable disease. Of 98 deaths for the last four months, the most common causes have been: Gastro-enteritis 22; malaria, especially the chronic cachectic type (aesto-autumnal), 20; tuberculosis 12; dysentery 5; pneumonia 6. Other causes: Still-births, eclampsia, endocarditis, nephritis, apoplexy, and accident.

The tremendous amount of uncinariasis present is shown by the local hospital statistics. Of 1,529 stools examined, ova uncinariae were found present in 698, or over 45 per cent. These figures are overwhelming considering the examinations were made in miscellaneous cases, even including surgical cases.

Acting Asst. Surg. C. L. Mengis reports as follows: Season of 1910 (May 1 to June 30). Sixty-seven vessels, with 1,167 crew and 825 passengers, were inspected. Temperatures were taken of 1,514 crew and 433 passengers. Two vessels were fumigated.

Yellow fever.—On June 29, 1 case of yellow fever occurred at San Jose, having been carried there from Siquires on fifth day of illness.

The yellow fever patient, a native of Costa Rica, was in the banana district near Siquires 14 days before being taken ill. The infected district was believed to be within an area of 20 miles, beginning at Estrada and ending at Siquires.

A previous case of yellow fever occurred on May 28 in the person of a foreigner landed May 27 at Limon from Barranquilla via Colon. The patient slept on the vessel on the night of May 27 and went, May 28, to San Jose, where he developed yellow fever.

PUERTO CORTEZ, HONDURAS.

Acting Asst. Surg. L. A. Wailes reports as follows: Season of 1909 (July 1 to October 31). One hundred and nineteen vessels, with a total of 2,532 crew and 598 passengers, were inspected. Health conditions at this port during the period were fair.

Acting Asst. Surg. Leroy Stowe reports as follows: Season of 1910 (April 20 to June 30). Forty-nine vessels were inspected, with total crews of 900. The sanitary condition of the port during the period was reported to be good.

TELA, HONDURAS.

Acting Asst. Surg. C. K. Roe reports as follows: Season of 1909 (July 1 to October 31). Twenty-two steamers and 380 passengers were inspected.

Season of 1910 (May 27 to June 30). Seventeen steamers were inspected. The general health conditions at Tela during the above periods were reported satisfactory.

INSPECTION AT OTHER FOREIGN PORTS.

In addition to the medical officers detailed to the several fruit ports above mentioned, officers were also detailed to the offices of United States consuls, in accordance with the act of Congress approved February 15, 1893, at the following ports for the purpose of enforcing the Treasury regulations provided for such ports and signing the bills of health in conjunction with the consuls.

At certain of the ports, viz, Bridgetown, Castries, and La Guaira, officers were detailed not only to certify as to the health conditions of vessels leaving these ports for the United States, but also to perform the necessary disinfection of said vessels when their original port of departure was an infected or suspected port. By fumigating these vessels, either for the destruction of mosquitoes or rats, and giving a certificate with regard to such disinfection, the time consumed by the passage of the vessel from the above-named ports to the quarantine stations in the United States was accredited to the vessel as a deduction from the time which might otherwise be demanded for detention at the United States quarantine station.

At a number of the other ports named below, particularly those in Italy, the officers, in addition to their quarantine inspection, made inspection of immigrants with reference to contagious or infectious diseases which might debar them from admission on arrival in the United States. These inspections were made in accordance with requests from the Immigration Service and the steamship companies, the officers exercising no positive right of exclusion, but informing the steamship companies and others of those who would be subject to rejection at the port of arrival under the Immigration Regulations.

Prior to January 15, 1910, the medical officers of the service stationed at the Chinese and Japanese ports made a medical inspection of intending emigrants destined for United States ports. This practice was ordered discontinued by the bureau upon the request of the Department of Commerce and Labor, the order being effective, as stated above, on January 15, 1910.

Following are extracts from the reports made to the bureau by the officers stationed at the ports named:

HABANA, CUBA.

The following is an extract from the report of Passed Asst. Surg. Hugh de Valin for the fiscal year ending June 30, 1909:

Since September 16, 1908, no case of yellow fever has been reported in the city of Habana, but on account of the possibility of a reappearance of the disease the Cuban health authorities have been very watchful, causing all cases of fever in nonimmunes to be seen by the Commission for the Diagnosis of Infectious Diseases, which consists of six physicians of large experience in yellow fever. During the fiscal year 1909–10 the commission saw 200 cases of fever in nonimmunes.

Operations of the service.—Aside from the general surveillance of ships and their personnel, the following transactions were reported in the weekly summaries during the fiscal year:

Bills of health issued	1,328
Vessels inspected	1,055
Passengers inspected	40,581
Members of crew inspected	53,684
Vessels fumigated	3
Immune certificates for Canal Zone	32
Health certificates issued	8,000

In addition, medical treatment was furnished to 29 seamen ill aboard American vessels.

Mortality report of Habana.—The following represents the number of deaths monthly in this city for the fiscal year:

Month.	Deaths.	Month.	Deaths.
1908.		1909.	
July	479	January	547
August	476	February	539
September	420	March	564
October	444	April	518
November	483	May	620
December	513	June	496
		Total deaths	6,099

Population of Habana, 315,000; mortality rate, 19.36 per 1,000.

CIENFUEGOS, CUBA.

The following is from the report of Acting Asst. Surg. J. R. Suarez:

STATEMENT OF INSPECTION SERVICE AND FUMIGATION OF VESSELS.

Month.	Vessels inspected.	Bills of health issued.	Crews inspected.	Passengers.
1909.				
July	10	10	314	0
August	14	14	339	0
September	11	11	319	0
October	15	15	464	13
November	16	16	504	8
December	15	15	576	0
1910.				
January	33	23	636	0
February	19	19	198	0
March	37	27	743	0
April	25	25	694	0
May	22	22	573	0
June	16	16	587	0
Total	233	213	5,947	21

The sanitary condition of the city on the whole has been satisfactory during the year.

MATANZAS, CUBA.

Acting Asst. Surg. E. F. Nunez reports as follows:

During the fiscal year 251 bills of health were issued to vessels bound for the United States, which shows an increase of 38 as compared with the previous year (1909). These vessels carried an aggregate number of 6,767 members of crews, 1 stowaway, and 639 passengers, mostly immigrants destined for various ports in Cuba and New Orleans, La.

The year has been uneventful so far as yellow fever and other quarantinable diseases other than leprosy are concerned. No case of yellow fever has been reported either as imported or originating in the city or Province, while two cases of leprosy have been reported in the city. These have been isolated at their homes, as authorized by the sanitary authorities for the last two years. Occasionally sporadic cases of the disease are reported, which are promptly sent to the San Lazro Hospital in Havana for segregation, if they have no means of isolating themselves in their homes, in accordance with the sanitary laws.

The usual quarantine has been enforced against Mexican, Central and South American ports, and those islands of the West Indies where quarantinable diseases have prevailed.

The total number of deaths from all causes in the city during the fiscal year just ended was 775, which shows a difference of 43 less than last year, and gives a mortality rate of 21.52 per mille.

SANTIAGO DE CUBA.

Acting Asst. Surg. Richard Wilson, on duty at this port, reports in part as follows for the fiscal year 1910:

Bills of health were issued to 294 vessels bound for the United States and its dependencies; 160 vessels were inspected. On these vessels there were 11,135 crew and 5,972 passengers.

The number of certificates of immunity to yellow fever issued during the year was 9.

During the fiscal year no case of quarantinable disease was reported at Santiago de Cuba with the exception of a case of leprosy. Early in February, 1910, through the initiative of Dr. J. M. Espin, those lepers of Santiago Province, 10 in number, who could not be properly taken care of at home, were collected and sent to Havana by train, in a car especially arranged for the purpose.

In the middle of April, 1910, 16 more cases of leprosy were sent. At that time, 2 were left in Santiago, there being now altogether 5 cases in the city.

Smallpox.—There were rumors of the presence of smallpox in March and April, 1910, but investigation proved said rumors to be unfounded. Beginning early in March the vaccination of children was inaugurated and practiced systematically on a large scale.

There have been many cases of varicella reported during the fiscal year. Enteric fever, scarlatina, and tuberculosis have also been present.

Malaria.—In November, 1909, there were many cases of malarial fever reported, many of them fatal. Most of these were brought in sick from the surrounding country, especially from a place about 30 miles away, where a new railroad was being built.

VERACRUZ, MEXICO.

Acting Asst. Surg. C. S. Carter reports as follows:

Season of 1909 (July 1 to October 31). Bills of health issued, 128; sailing vessels inspected, 4; steam vessels inspected, 40; steam vessels fumigated, 84; passengers inspected, sailing vessels, 0; passengers inspected, steam vessels, 2,500; number of crew inspected, sailing vessels, 32; number of crew inspected, steam vessels, 5,662; total number passengers and crews, 8,194.

Season of 1910 (April 21 to June 30). Seventy-four vessels, with 3,332 crew and 1,432 passengers, were inspected. Forty-two vessels were disinfected.

Yellow fever.—The last case of yellow fever definitely proven to have originated in Veracruz was in February, 1909, a doubt having existed as to the source of infection of the *Fuerst Bismark* case of June, 1909. The case of September, 1909, came from Yucatan, dying within a few hours after removal to hospital in Veracruz.

The disappearance of yellow fever from Veracruz is due to the excellent work performed by the local commission charged with the sanitary work for the prevention of yellow fever. The commission continued actively at work throughout the year. This sanitary brigade consists of about 40 men who keep daily watch upon all incoming passengers by rail, make daily house-to-house inspections, and oil all pools and other deposits of water. Any case of fever of a suspicious nature is at once removed to a screened ward in the local hospital for observation.

It is also owing to the work of this sanitary commission that Veracruz is in its present excellent sanitary condition. There is no standing water to be found in gutters, and the streets are well paved and are kept clean by constant effort together with a rigid enforcement of the law.

Mortality statistics.—From a study of the official statistics it is shown, in round numbers, that of every 100 deaths the following are the causes:

Tuberculosis	25
Malarial fevers	13
Other general diseases, considered under the Bertillón classification	5
Diseases of the digestive apparatus	18
Diseases of the respiratory organs	8
Diseases of the nervous system	2
Infantile diseases	25
Sundry causes	4

These figures show that tuberculosis and infantile diseases constitute 50 per cent of the present approximate death rate of 50 per 1,000 based upon an estimated population of 40,000.

Typhus, typhoid, diphtheria, smallpox, and other eruptive fevers are of rare occurrence in Veracruz. Typhus and typhoid do not spread in the city, and the few cases coming under observation are impoted and have never formed foci of infection.

The high percentage of deaths from infantile diseases is due almost entirely to the fact that the children of the poorer classes live under the worst possible hygienic conditions, and neglect the most rudimentary rules of hygiene.

On July 8, 1910, the port of Veracruz was declared clean, and all quarantine restrictions were removed thereform by special bureau order.

SALINA CRUZ, MEXICO.

Acting Asst. Surg. Alfredo E. Gochicoa reports as follows:

For the fiscal year ended June 30, 1910, 67 vessels bound for ports in the United States and its insular possessions were inspected, of which number 58 were fumigated. These vessels carried a total of 451 passengers and 2,903 crew. The fumigation of vessels leaving Salina Cruz for ports in Hawaii is regularly performed for the destruction of mosquitoes.

No yellow fever has been reported in Salina Cruz since 1905. The general health conditions during the period have been reported good.

COATZACOALCOS, MEXICO.

Acting Asst. Surg. W. R. P. Thompson reports as follows:

During the fiscal year ended June 30, 1910, 233 vessels were inspected and 33 fumigated. The general health of the port during this period was good, the prevailing diseases being malaria and intestinal disorders.

PROGRESO, MEXICO.

Acting Asst. Surg. J. F. Harrison reports as follows:

Season of 1909 (July 1 to October 31). Seventeen vessels were spoken and passed, 67 steamers were inspected and passed, 39 steamers were disinfected and passed, 1 sailing vessel inspected and passed, and 1 sailing vessel disinfected; 3,758 crew and 279 passengers were inspected.

Season of 1910 (April 1 to June 30). Five vessels were spoken and passed, 35 steamers were inspected and passed, 20 steamers were disinfected and passed, 2 sailing vessels were inspected and passed, and 2 sailing vessels were disinfected; 1,817 crew and 234 passengers were inspected.

TAMPICO, MEXICO.

Acting Asst. Surg. Le Roy Stowe reports as follows:

Season of 1909 (June 30 to October 31, 1909). Ninety-five vessels were inspected and passed, 2,653 crew and 102 passengers inspected, and 18 vessels fumigated. No cases of quarantinable disease occurred during this period. The prevailing diseases have been the malarial fevers and tuberculosis. During the season of 1910 no representative of the service was stationed at Tampico, the general health conditions there being such as not to warrant it.

BRIDGETOWN, BARBADOS.

Acting Asst. Surg. R. H. Urquhart reports as follows:

Season of 1909 (July 1 to October 31):

Bills of health issued	126
Passengers and crews examined	7,785
Vessels fumigated	0

Yellow fever.—On August 24, 1908, there occurred a fatal case of yellow fever.

Between December 12, 1908, and October 31, 1909, there occurred 87 cases of yellow fever, with 22 deaths.

Acting Asst. Surg. George B. Le Sueur reports as follows:

Season of 1910 (May 15 to June 30). Forty-three vessels, with 1,915 crew and 786 passengers, were inspected. Eight vessels were fumigated. No quarantinable diseases were reported during this period.

CASTRIES, ST. LUCIA.

Acting Asst. Surg. A. J. Maylie reports as follows:

Season of 1910 (April 26 to June 30, 1910). Sixty-two vessels were inspected and 40 fumigated. These vessels carried a total of 1,967 crew and 64 passengers. No quarantinable diseases prevailed during this period either in the port or in the vicinity thereof.

ST. THOMAS, DANISH WEST INDIES.

Acting Asst. Surg. W. F. Wild reports as follows:

Season of 1909 (July 1 to October 31). Sixty-nine vessels were inspected and 4 fumigated.

During the season of 1910 no representative of the service was stationed at St. Thomas.

LA GUAIRA, VENEZUELA.

The following is abstracted from the report of Acting Asst. Surg. Wilfred H. Kellogg:

Plague.—In February plague appeared for the first time in Puerto Cabello, one of the most important seaports in Venezuela and distant about 60 miles from La Guaira. There were only two cases, with one death, in which the diagnosis of plague was verified.

The Government has been improving the wharf at Puerto Cabello by destroying the old wooden structure, which afforded an excellent refuge for rats, and replacing it by a building constructed of solid concrete. The warehouses of the customs service, which are located on the docks, have at the same time been reconstructed with concrete and galvanized iron in such a manner that they are now nearly as rat proof as it is possible to make them.

During the year there appeared in Caracas 13 cases of plague, as follows: In July, 4 cases; August, 5 cases; and October, 4 cases. Plague has also been reported in Port of Spain, Trinidad, a port of call for three lines of steamers which subsequently touch at La Guaira before proceeding to New York, Galveston, and Colon, respectively.

Yellow fever.—La Guaira should be regarded as an endemic focus of yellow fever and Caracas should also be so considered, notwithstanding the fact that the number of cases of yellow fever occurring in these places was small.

The water supply of both towns is piped from the mountains and mosquitoes are not very numerous.

During the fiscal year ended June 30, 1910, 14 cases of yellow fever with 12 deaths were reported in La Guaira and Maiquetia, and there was a small outbreak of yellow fever in Caracas, but the actual number of cases occurring in the latter place was not reported. The distribution of cases by months in La Guaira was as follows: August, 2; November, 5; January, 1; March, 4; and April, 2.

During the latter part of November there were rumors of yellow fever in Valencia, which caused considerable concern on account of the proximity of this place to Puerto Cabello, the port of departure for a number of vessels bound for Porto Rico and Colon. An inspection trip made of Valencia for the purpose of investigating the nature of the disease showed it to be pernicious malarial fever which had caused an increased mortality among the half-starved natives.

Fumigation.—Since the appearance of plague in Puerto Cabello and the suspicion of yellow fever there, the fumigating and dispatching of vessels from that port bound for Porto Rico has been added to the duties of the La Guaira station. Up to July 1 a total of 15 ships have been fumigated after discharging cargo. They are required after fumigation to haul off 20 feet from the wharf and to load at that distance.

Transactions:

Steamships inspected	156
Sailing ships inspected	2
Total number of passengers in transit	5, 976
Total number of passengers embarked	1, 573
Total members of crews	11, 166
Baggage inspected, pieces	930
Ships fumigated	15

CALLAO, PERU.

Acting Asst. Surg. J. L. Castro-Gutierrez reports from Callao, Peru, for the fiscal year ended June 30, 1910, as follows:

One hundred and twenty-three vessels disinfected, 9,419 crew, 3,745 cabin passengers, and 3,554 steerage passengers were inspected; 2,026 persons received health certificates; 468 persons received vaccination certificates; 275 pieces of baggage were inspected and passed, and 2,688 pieces disinfected.

Bubonic plague in Peru.—During the calendar year of 1909, 999 cases of plague have been reported in Peru, of which 508 recovered and 492 died, leaving a balance of 37 remaining in treatment at the beginning of the year 1910. The number of cases occurring in the preceding year was 1,691, so that there has been more than one-third less cases in 1909. It is not possible this year to give the number of plague-infected places because the Direccion de Salubridad Publica has changed the mode of reporting the cases, preferring to present its reports by departments. According to these reports, excepting the ports of the department of Ancachs, all the ports of the coast of Peru are infected or suspected of being infected with plague, especially such ports as Callao, Mollendo, Paita, Salaverry, Pacasmayo, Eten, and Huanchaco.

Smallpox in Peru.—Because the vaccination and revaccination laws are obligatory in Peru and very strictly applied, epidemics of smallpox seldom occur in the coast towns; in the sierra they occasionally occur, but promptly respond to vaccination.

Other transmissible diseases.—Between those transmissible diseases which predominate on the Peruvian coast, tuberculosis and malaria may be cited and in some periods of the year influenza. Typhus exanthematicus is seen on the coast, but only in cases imported from the sierra. Diphtheria is rare. Cholera nostras occasionally occurs in summer.

GUAYAQUIL, ECUADOR.

Passed Asst. Surg. Herman B. Parker reports as follows:

Maritime quarantine.—During the fiscal year bills of health were issued to 94 vessels, 8 of which were inspected and passed, destined to New York via the quarantines of Peru and Chili and of the service on the Atlantic seaboard; 86 vessels were fumigated to kill rats or mosquitoes; certificates of fumigation were issued to 13 vessels destined to San Francisco, Cal., the remaining 73, destined to the Canal Zone, were subjected to a partial fumigation on account of having anchored at a safe distance below the infected area of Guayaquil.

The following is a summary of the quarantine transactions for the year:

Vessels inspected and passed	8
Vessels fumigated	94
Number of crew inspected	5,168
Number of cabin passengers inspected	927
Number of steerage passengers inspected	794
Pieces of baggage fumigated since Jan. 1, 1910	1,333
Pieces of baggage inspected and passed (Jan. 1, 1910)	854
Certificates for hides issued since Jan. 1, 1910	44

Anchorage.—There are two anchorages for vessels in the port of Guayaquil, one being directly off the city proper and the other about a mile and a half below the center of the city. Those vessels not carrying passengers and those destined for ports considered safe as regards yellow fever are permitted to anchor at the first anchorage, while those vessels destined for Panama are required to anchor at the second anchorage. The second anchorage is a considerable handicap to the commerce of the port, and recently requests have been made by the principal shippers and port officials to permit a change of anchorage nearer the city during the dry season.

After a consultation with the chief quarantine officer of the Canal Zone the service officer at Guayaquil deemed it inadvisable to change the present anchorage until permanent sanitary improvements were commenced by the city.

Passenger traffic.—During the fiscal year 927 cabin and 794 steerage passengers were inspected and permitted to sail. These passengers with few exceptions were inspected on board the vessel immediately prior to sailing. Of these passengers, two developed yellow fever and died in the Ancon quarantine station, one in December and one in March, both being first-cabin passengers. The inspection of passengers could be improved by conducting the examination in the office prior to embarkation, but this is only possible with the assistance of an experienced baggage examiner and disinfector.

Baggage.—From January 1, 1910, to June 30, 1910, there were 1,333 pieces of baggage fumigated and 854 pieces inspected and passed. The baggage is fumigated in a zinc-lined room, sulphur being the fumigating agent, 2 pounds for each 1,000 cubic feet of space. A large class of baggage, consisting of mattresses, bedding, and soiled or dirty clothing, is now prohibited, the fumigating process being considered inefficient for such baggage. Clean baggage is inspected and passed, as also is baggage from the interior from localities where plague does not prevail.

Hides.—In conformity with the quarantine laws relating to the shipment of hides from a plague-infected port, dry hides, chemically cured with arsenic, stored in a rat-proof warehouse prior to embarkation and subjected to sulphur fumigation on board the vessel, are permitted to pass through or to United States territory.

Fumigation of vessels.—The fumigation of vessels at Guayaquil is not conducted with a view of disinfection but for the destruction of the hosts or transmitters of yellow fever and plague. In order to render less likely the contamination of vessels by the above-mentioned diseases they are not permitted to dock at Guayaquil and communication is maintained only through the medium of open boats and lighters, and, on account of the special anchorage for the Panama trade, the danger of actual infection is reduced to a minimum.

Prior to sailing for United States territory vessels are subjected to sulphur fumigation, 2 pounds of sulphur to each 1,000 feet of space (cargo space not being considered), giving an average yield of always more than 3 per cent SO_2 gas, with a minimum exposure of six hours. Three of the four vessels plying between Guayaquil and Panama are fumigated by the open-pot method, one vessel having the Clayton apparatus. Experience with the Clayton apparatus shows good results if properly handled. The condenser system is an improvement over the old-style apparatus and the permanent fixtures leading from the machine to the various compartments present a decided advantage over the flexible hose. The experiments of Rosenau show that the cold gas is not inefficient in germicidal action and is certainly much less destructive to the vessel and cargo than the hot or warmer gases of other apparatus. The native sulphur is of good quality for fumigation, burning rapidly, seldom requiring attention when properly ignited, and leaving very little residue.

Yellow fever on vessels in Guayaquil.—During the present fiscal year yellow fever appeared on two vessels while at anchor in the middle of the river opposite the city; both were coal vessels. In the one, in January, there were three cases and no deaths, and in the other, in March, there were two cases and two deaths. It is reasonable to suppose that in some instances the disease was contracted on board the steamers. Each year there are about 10 vessels loaded with coal from Philadelphia for Guayaquil.

The time required for unloading each vessel will average three weeks and each year a certain number of officers and seamen pay the penalty of death through a lack of information on the subject of yellow fever infection and inadequate protection from the disease while in port. It would be a humane act for the consul representing the nationality of the vessel or the port authorities of the United States to transmit with the ship's papers a comprehensive service paper on protection against tropical diseases, especially malaria and yellow fever, and, if it were possible, insist that the material to afford such protection be placed on board the vessel prior to clearance. Materials for such protection can not be purchased here and arranged or placed on a vessel within much less than a week and at an expense of many times what it would cost in the United States. Dr. Parker was informed that there is one line running up the Amazon River which not only provides protection for its officers and crew while in malarial countries, but provides in the ship's articles that violations of sanitary regulations while on board the vessel, such as sleeping on the deck at night, is punishable by fine or otherwise, and relieves the ship from damages or claims under the recent employers' liability act.

Plague on board vessels.—During the fiscal year it has come to the knowledge of Dr. Parker that human plague appeared on at least two vessels on the coast of Ecuador, both steamers belonging to the Cosmos Line which plies between Hamburg, Germany, and San Francisco, Cal. The first case was on the steamer *Ammon* which docked in Callao, Peru, several times in 1909, the last time on December 3. The last plague case occurred on the steamer *Nicaria* which sailed from Guayaquil for San Francisco on June 2, 1910. The vessel had shipped a sailor at Iquiqui, Chile, on May 12, 1910, the disease developing on May 19, 1910.

Yellow fever in Guayaquil.—During the fiscal year there were reported by the director of health 388 cases of yellow fever in Guayaquil, with 148 deaths, a mortality of 38.14 per cent. During this period there were registered 184 burials from yellow fever in the various cemeteries. It may be stated, irrespective of the number of cases actually existing, that this disease is widespread throughout the city at all times, so that a nonimmune alien must eventually contract the disease. While the foreign population is naturally susceptible, the native population from the interior really keep the disease existent, they being as susceptible as the alien, and from their habits much more readily contract the disease. The months from November to March furnish a larger number of cases and deaths than other months on account of the heavy rains and other conditions favoring the propagation of the mosquito host of this disease.

Yellow fever outside of Guayaquil.—Duran, the terminus of the Quito railroad, a small town across the river and near Guayaquil, furnishes annually a number of cases proportionate to the nonimmune population. Some of these cases originate in Guayaquil while others receive their infection locally. From this town the disease spreads periodically to the small towns along the railroad at least 60 miles into the interior, but no accurate record of these cases is available.

Babohoyo, a small town about 60 miles up the Daule River, is in daily communication with Guayaquil by means of small river steamers, reports annually a small number of cases. This fiscal year there were reported three cases in January, one in February, and two in March.

Plague in Guayaquil.—Plague assumed this year a much more threatening aspect with the native population than yellow fever did with the alien. While the disease was reported throughout the year with a total of 716 cases and 257 deaths, a mortality of 35.89 per cent, the months of September, October, November, and December furnished the largest number of cases. Considerable work was accomplished by the sanitary department, but they are so handicapped by the peculiar construction of the buildings and the general apathy of the people to sanitary progress that it is doubtful if they will accomplish more than to keep the disease within epidemic proportions.

Sanitation and morbidity in Guayaquil.—There is little, if any, municipal sanitary work in progress in the city of Guayaquil. There is a primitive water supply that furnishes water about two hours each day to the city. It is necessary to store this supply in the houses for daily consumption, hence the presence of breeding places for the yellow-fever mosquito, the *Stegomyia calopus*, and hence the continuation of this disease. A few of the streets have sewers, but the greater portion of the city depends upon barrels and other containers to store sewage until its periodic removal by the city. A few of the streets are paved but the great majority are unpaved, and during the rainy season are below the water level and in consequence are flooded.

During the fiscal year there were registered approximately 3,492 deaths from all causes in the city. Accepting the population as 70,000, this would give a mortality of 49.88. There must have been many deaths that were not recorded as a comparison of the various tables presented shows marked variations, so that it may be accepted that the mortality is probably considerably more than 50 per thousand. The morbidity naturally bears a definite relation to the mortality, and if the more or less readily preventable diseases were excluded the city would compare favorably with any community in the world.

During the year no permanent sanitary improvements were commenced.

YELLOW FEVER IN GUAYAQUIL, ECUADOR, JULY 1, 1909, TO JUNE 30, 1910.

Months.	Remaining from previous month.	New cases.	Cured.	Died.	Remaining.
July	12	25	23	11	3
August	3	16	7	8	4
September	4	20	10	7	7
October	7	29	18	13	5
November	5	43	25	17	6
December	6	41	18	15	14
January	14	46	38	11	11
February	11	48	37	15	7
March	7	41	27	16	5
April	5	27	14	11	7
May	7	37	22	14	8
June	8	15	12	10	2
Total	89	388	251	148	79

PLAGUE IN GUAYAQUIL, ECUADOR, FROM JULY 1, 1909, TO JUNE 30, 1910.

Months.	Remaining from previous month.	New cases.	Cured.	Died.	Remaining.
July	15	23	12	11	15
August	15	39	15	8	31
September	31	85	50	29	37
October	37	122	73	39	47
November	47	168	90	65	60
December	60	130	97	47	46
January	46	62	57	31	20
February	20	33	25	10	18
March	18	25	25	9	9
April	9	18	20	7	....
May	....	5	5	....	....
June	....	6	1	1	4
Total	289	716	470	257	287

RECORD OF DISEASES AND DEATHS IN GUAYAQUIL, ECUADOR, DURING THE FISCAL YEAR 1910.

Months.	Plague.	Smallpox.	Yellow fever.	Fever.	Malaria fever.	Typhoid fever.	Tuberculosis.	Pneumonia.	Intestinal diseases.	Dysentery.	Meningitis.	Whooping cough.	Tetanus.	Syphilis.	Erysipelas.	Cancer.	Stillborn.	Other causes.	Total.
July	43	...	44	24	18	4	39	16	32	15	4	2	1	...	...	6	19	68	335
August	8	...	16	27	15	7	64	19	48	31	7	10	9	2	...	8	13	83	367
September	22	...	5	21	21	4	72	23	48	18	7	5	5	1	1	7	15	108	383
October	18	...	6	18	17	2	42	11	36	5	8	7	3	...	...	2	13	71	259
November	77	...	27	22	21	1	36	9	45	5	1	8	7	...	2	1	14	64	340
December	61	1	18	13	16	5	28	13	38	1	4	6	1	...	1	1	11	64	282
January	41	...	18	21	25	3	39	6	53	4	5	3	4	...	...	2	11	64	299
February	4	...	4	26	11	1	26	10	64	7	7	4	3	1	...	2	13	55	238
March	1	1	1	18	27	2	39	13	59	14	4	2	3	...	...	5	9	52	250
April	9	...	17	22	15	3	44	6	24	3	6	2	2	1	1	5	14	80	254
May	1	1	17	44	6	5	37	10	23	7	3	4	6	1	1	2	20	59	247
June	1	...	11	32	10	3	39	5	20	6	4	4	6	1	...	3	19	64	228
Total	286	3	184	288	202	40	505	141	490	116	60	57	50	7	6	44	161	832	3,492

HONGKONG, CHINA.

Passed Asst. Surg. A. D. Foster reports as follows:

Bills of health were granted to 464 vessels, carrying an aggregate of 10.211 cabin passengers, 16,743 steerage passengers, and 43,777 crew. The number of members of crew bathed was 29,592 and the number of steerage passengers 15,946. There were disinfected 45,498 pieces of baggage.

Eighty-four vessels were fumigated with sulphur gas for the purpose of killing rats and vermin. The crew's quarters of 343 vessels were disinfected by formaldehyde and of 84 vessels by sulphur gas.

During the past year the number of vessels fumigated with sulphur dioxide at Hongkong for the purpose of destroying rats and vermin has increased. Since the new docks at Manila have been completed vessels from Hongkong now discharge their cargo at the wharves at Manila instead of anchoring in the bay, as formerly. The frequent fumigation of vessels is thus rendered necessary in order to prevent the introduction of plague-infected rats into the Philippine Islands.

Vessels leaving Hongkong for United States ports are fumigated every six months, and also each time they go into dry-dock at Hongkong.

The health conditions of Hongkong have been remarkably good during the past year. Not since 1898 have there been so few cases of quarantinable diseases reported. Antiplague measures have been actively carried on. During the calendar year 1909, 60,113 rats were caught or found dead in Victoria (Hongkong), and 16,022 in Kowloon. These rats were examined and 399 from Hongkong and 168 from Kowloon were found to be infected with plague. It is somewhat remarkable that throughout the whole year there was a preponderance of female over male rats caught. Of the total number of rats delivered in Hongkong, 29,946 were males and 30,167 females.

Number of cases of communicable diseases reported in Hongkong during the fiscal year ending June 30, 1910.

	Cases.	Deaths.
Plague	29	21
Diphtheria	30	3
Enteric fever	69	23
Puerperal fever	21	17
Smallpox	25	10

The number of aliens examined was 5,462, of whom 1,261 were rejected for diseases or disability which would exclude them from entry under the immigration laws. This examination was discontinued on January 15, 1910, in compliance with bureau order of December 17, 1909. The examination of passengers destined to United States and Philippine ports is now made for the purpose of detecting quarantinable diseases only.

SHANGHAI, CHINA.

Acting Asst. Surg. S. A. Ransom reports as follows:

The fiscal year ended June 30, 1910, has been uneventful from a quarantine standpoint in Shanghai. Quarantinable diseases have been for the most part absent from the settlement, although smallpox has claimed its quota of victims, and cholera has also been responsible for the death of a good many foreigners and natives, notwithstanding the fact that it was not officially reported in the municipal statistics.

There has been a general increase in the volume of work at Shanghai, not only as compared with last year but as compared with the reports for previous years. This is particularly apparent with regard to the total personnel of vessels clearing, the number being more than double that for last year and for the year 1906–7. More vessels have been disinfected during this fiscal year than during the last year.

Transactions.

Vessels spoken and passed	55
Steamers inspected and passed	101
Steamers disinfected	15
Number of crew on steamers	23, 333
Number of passengers on steamers	16, 487

Under the heading "Vessels spoken and passed" is included all naval vessels which have been granted bills of health without inspection upon a certificate signed by the medical officer that such vessel and personnel are free from danger of conveying communicable disease. Likewise are included in this class all vessels of the Pacific Mail, Toyo Kisen Kaisha, and allied lines calling at Shanghai for only a few hours, and which do not permit any of the crew or steerage passengers to hold communication with the shore, the vessels remaining in the stream at Woosung, several miles from the shore. These latter vessels should not really come under the above designation, as an inspection is held in each case at the tender at the hour of departure, when the steerage passengers from Shanghai are given their final examination and the vessels' bill of health completed and delivered.

Plague.—As stated in the beginning of this report, Shanghai has been comparatively free from quarantinable diseases during the past fiscal year. It is gratifying to note that the methods employed by the local health authorities in combating the threatened invasion of bubonic plague seem to have been entirely successful so far as its development among human beings is concerned, as not a single case has been reported. The disease practically disappeared even among the rats during last summer, but there was a slight recrudescence in October which kept up throughout the winter months. It has, however, again decreased with the advent of hot weather. The majority of the infected rats have been found in the "Hongkew district," or American settlement, along the water front where the greatest number of wharves are located. For this reason it has been thought desirable to require all vessels en route to the United States or Philippines to remain in the stream while loading.

Mortality.—The following will show the number of cases and deaths from communicable diseases reported in Shanghai from July 1, 1909, to June 30, 1910:

	Cases.	Deaths.
Smallpox	17	138
Enteric fever	22	....
Diphtheria	16	57
Scarlet fever	27	91
Tuberculosis	11	793

Total deaths: Foreigners, 186; natives, 9,026.

The above figures can not be taken at their face value, as the methods of collecting statistics in Shanghai are reported to be very faulty.

The total number of emigrants inspected at Shanghai during the fiscal year was 515, with 114 rejections for trachoma. As the result of a request from the Department of Commerce and Labor, the examination of aliens prior to their departure from ports in China and Japan was discontinued January 15, 1910.

AMOY, CHINA.

Acting Asst. Surg. T. Morehead reports as follows:

During the year 51 bills of health were issued, of which 50 were for vessels bound for the Philippines and 1 for San Francisco.

Plague and cholera were prevalent in epidemic form during the months of July, August, September, and October, 1909.

In November, on the recommendation of Passed Assist. Surg. A. D. Foster, who was in charge of the office at that time, the quarantine against Amoy, which was maintained by the Philippine authorities, was raised, plague and cholera having subsided in Amoy.

In December, 1909, smallpox became epidemic in Amoy, and the vaccination of all passengers to the Philippines was instituted. This epidemic of smallpox was very severe during the months of January and February, 1910, there being very many cases of the hemorrhagic type, and the death rate among the Chinese was very high.

Plague.—In March of this year, plague, chiefly of the pneumonic type, appeared in Amoy City. One foreigner who had been attending a case on its first appearance in Amoy City succumbed to the disease. The plague epidemic in Amoy City has not been as severe numerically as in previous years, but the type of the disease has been very fatal. In several cases families of 8 to 12 persons in one house have succumbed to the disease in a few days. In the surrunding districts the death rate has been very high. Haffkine's prophylactic has been freely used by the physicians attached to the missions in the affected districts, the Chinese willingly submitting to inoculation.

Cholera.—No cases of cholera have been so far reported. Last year cholera was reported early in June.

Other diseases.—Of the other general diseases, malaria, influenza, unclassified fevers, beriberi, dysentery, diarrhea, tuberculosis, and typhoid are present. Typhus fever is said to occur amongst the Chinease.

The general health of the foreign community in the international settlement of Kulangsu continues to be good. The health conditions have become much improved in the last few years, but in Amoy City there has been no attempt made at sanitary improvements, although a Chinese physician has been appointed health officer.

Disinfection.—The disinfection hulk has been in use by only one British shipping firm, the other firm having erected a very large plant in a newly-built shed. Both plants are in good working order and no difficulty is experienced in the bathing and disinfection of coolies, although the hulk is more practicable owing to its being taken alongside any vessel, whereas in the case of the disinfection plant on shore all the passengers have to be taken off to the vessel in lighters after disinfection and bathing, which results in a loss of time.

YOKOHAMA, JAPAN—QUARANTINE AND SANITATION IN JAPAN.

Surg. Fairfax Irwin reports, in part, as follows for the fiscal year ended June 30, 1910:

Summary of transactions.

Steamships inspected and granted bills of health	250
Sailing vessels inspected and granted bills of heath	13
United States war vessels granted bills of health	18
United States collier *Tahoma* granted bill of health	1
Japanese training ship granted bill of health	1
French armored cruiser *Montcalm* granted bill of health	1
Total bills of health granted	285

Saloon passengers upon the above vessels	7,734
Second cabin passengers upon the above vessels inspected	1,958
Steerage passengers upon the above vessels inspected	27,299
Crew upon the above vessels inspected	43,200
Persons required to bathe and undergo special inspection	2,067
Pieces of baggage disinfected under supervision of this service	5,806
Crew bathed	472
Vessels fumigated	41

No vessel was held during the fiscal year, as no quarantinable disease was found on any outgoing ship.

A number of cases of both measles and diphtheria were found and sent ashore to the hospital.

One case of leprosy, an Hawaiian woman, arrived on the steamer *Chiyo Maru*, and was refused a landing by the Japanese quarantine authorities. She was returned on the same vessel to Honolulu.

Plague and smallpox are the two diseases to be feared on account of the proximity of Yokohama to Hongkong, Shanghai, and East Indian ports. There has been no case of smallpox reported at Yokohama during the fiscal year and the last case of human plague was published July 12, 1909.

Several vessels arrived at Honolulu with smallpox on board and it was difficult to be sure of the origin. It is probable, however, that these cases had their inception at Hongkong or Kobe.

One hundred and thirty-five plague-infected rats were found during the year 1909.

There were 28 cases of human plague during the same period, of which 22 died.

Fumigation of all vessels bound for the Philippine Islands was required when empty, and in the case of the Manila-Australia Line was required each voyage.

The treatment of steerage passengers and members of crews leaving this port remains the same, all being bathed and their effects disinfected unless their histories are known to be favorable. All steerage passengers from cholera or plague infected districts are detained for observation during the incubation period of these diseases.

All consular invoices and boat notes are required to be presented for check and certificates of origin for foodstuffs and plants must be shown.

Disinfection of human hair, certain skins and feathers, and all doubtful personal effects is required.

The quantity of human hair now being exported from Japan is very great, and while it is true that the hair is in a very filthy condition when it arrives, the disinfection and preparation is so thorough that no danger need be apprehended from its use.

Sanitary conditions—Empire of Japan.—The year has been marked by a great increase of cases of typhoid fever. Cases of smallpox, cholera, and plague have not been very frequent.

Accurate statistics have been obtained for the year 1909, and for the months of January and February, 1910, only.

Cholera.—During the period from January 1, 1909, to December 31, 1909, there were 328 cases and 221 deaths in the whole of Japan. No cases have been reported during the year 1910.

Plague.—Osaka and Kobe continue to be the danger points for this disease. In Japan during 1909 there were reported 391 cases of plague, with 312 deaths. During the first two months of the year

1910, there have been reported only 6 cases, all fatal. These occurred at Osaka or Kobe, and a few cases continue to be reported from time to time.

Smallpox.—Owing to the new regulations enforcing vaccination, the incidence of this disease has fallen off in a most decided manner. In the year 1909 there were reported only 106 cases and 26 deaths, and for the period from January to February, 1910, 10 cases and 1 death.

Leprosy.—Nothing further has been heard of the isolation hospitals mentioned in late reports from this office, and the status remains about the same. A quotation from the report of 1908 is here given:

> From statistics already forwarded it may have been seen that with 37,431 leper beggars frequenting temples and public places, and 6,877 having fixed homes, yet too indigent to receive treatment, this disease is a serious menace in the Empire of Japan.

One case of leprosy arrived here from Honolulu, but was refused a landing by the Japanese quarantine authorities, and so returned on the same vessel.

Dysentery.—The year 1909 showed a large increase in the number of cases of this disease; 28,006 cases were reported, with 6,836 deaths, very nearly as great a mortality as that of typhoid fever. The number of cases for the first two months of this year was 91, with 27 deaths.

Typhoid fever.—The last few months have been characterized by an epidemic of typhoid fever at Tokio, for which accurate statistics are not yet obtainable. The number of cases for all Japan during the year 1909 was 25,106, with 5,470 deaths. For the first two months of the current year, 2,262 cases and 483 deaths.

Tuberculosis.—As this disease is not among those notifiable, no official returns of the number of cases and deaths can be obtained.

Provision is made for the inspection of milch and beef cattle, and for the use of tuberculin for purposes of diagnosis.

Scarlet fever.—During the year 1909, there were 1,527 cases and 337 deaths from this disease in Japan, and in the first two months of the year 1910, 419 cases and 83 deaths.

Diphtheria.—Eighteen thousand one hundred and two cases of this disease occurred, with 5,121 deaths, in 1909. In 1910, up to March 1, 3,598 cases and 1,086 deaths were reported.

Typhus fever.—This disease appears to have almost entirely disappeared from Japan. In 1909 there were three cases reported, two of them fatal. In the year 1910, two cases and one death. These cases occurred in Nagasaki-ken.

SANITARY CONDITIONS IN YOKOHAMA.

The population of Yokohama according to the last police census was 407,432.

The registered births were 8,146; the deaths, 6,503. The annual death rate was 16.002 per 1,000, as compared with 14.28 in 1907, 11.12 in 1906, and 12.7 in 1905.

The official report of contagious diseases shows for the year ending June 30, 1910:

	Cases.	Deaths.
Diphtheria	154	40
Typhoid fever	150	25
Dysentery	87	13
Scarlet fever	31	0
Plague	6	6

One hundred and thirty-five pest-infected rats were found during last year (1909), the last one on the 23d of July, 1909.

Plague.—Twenty-eight cases human plague occurred during the current fiscal year, of which 22 were fatal. The last case was reported July 12, 1909.

Cholera.—No case of cholera has been reported during the year.

Smallpox.—There have been no cases of smallpox at this port.

Physical examinations.—Examinations for the United States Immigration Service up to the 15th of January, 1910, on which date this examination was suspended in accordance with bureau order:

Number examined	1, 091
Passed	877

KOBE, JAPAN.

Acting Asst. Surg. Garland P. Moore reports in part as follows on the transactions at this station during the fiscal year ending June 30, 1910:

Vessels inspected and passed	242
Vessels disinfected	19
Passengers inspected	29, 669
Crew inspected	28, 548
Pieces of freight inspected and disinfected	2,517
Cases of quarantinable diseases inspected	5
Number of pieces of baggage inspected and disinfected	14,352

Bills of health.—Consular bills of health were issued to 242 vessels, of which 19 were original and 223 were supplemental. The personnel of all of these vessels were inspected as nearly as possible at the hour of their departure.

The holds of 19 vessels were fumigated with sulphur dioxide gas to kill vermin on board. After fumigation the crews were bathed and their effects disinfected by steam and their quarters washed with a solution of mercuric chloride.

Plague.—Whenever plague is present in Kobe, intending steerage passengers for the United States and its dependances are detained for seven days at the Ono detention and isolation compound, which was fully described in the annual report of 1908. Upon entering the station they are inspected for quarantinable diseases, those passed bathed and their personal effects disinfected by steam. The passengers are then required to remain seven days under observation.

According to the official reports of the municipal health department Kobe has been infected with plague almost throughout the entire year; the last case occurred May 18, 1910.

The number of rats examined during the year by the Japanese officials were 458,520, of which number 1,489 were found to be infected. The number of infected rats found is slowly decreasing.

During the year five cases of quarantinable disease were taken from steamers in the harbor, the steamers being thoroughly fumigated and disinfected in accordance with the United States quarantine regulations.

Infectious diseases.—The official report of infectious diseases during the year is as follows:

	Cases.	Deaths.
Kobe:		
Plague	212	165
Smallpox	3	1
Enteric fever	144	42
Diphtheria	140	61
Dysentery	122	34
Scarlet fever	8	....
Osaka (20 miles distant):		
Plague	45	43
Smallpox	1	....
Cholera	5	3

On January 15, 1910, the inspection of intending emigrants by medical officers of the service at the Chinese and Japanese ports was discontinued. For the period ending January 15, 1910, 1,068 emigrants were inspected at Kobe.

NAGASAKI, JAPAN.

Acting Asst. Surg. Robert I. Bowie reports as follows: One hundred and four vessels, carrying 21,768 crew and 35,651 passengers, were inspected during the year. The health of the port during the year was good, with the exception of a few cases of diphtheria, variola, and enteric fever.

LIBAU, RUSSIA.

Owing to the prevalence and spread of Asiatic cholera in Russia, and the danger of the importation of this disease through immigrants arriving in the United States, a medical officer of the service, Acting Asst. Surg. C. M. De Forest, was assigned to duty in the office of the American consul at Libau, Russia, on September 26, 1908.

Transactions.—The transactions for the fiscal year ended June 30, 1910, are as follows:

Number emigrants examined	20,971
Number emigrants sailed	17,996
Number held back	2,975
Number held for trachoma and favus	2,877
Number held back by representative of the Public Health and Marine-Hospital Service	98
Diseases certified to:	
Measles	10
Chicken pox	9
Diphtheria	1
Smallpox	4
Fevers and suspected cases	3
Total baggage disinfected	4,643
Crew and officers examined	2,470

Quarantine inspections.—At Libau all emigrants are required to be in the city and to have undergone the first inspection five full days before departing for the United States. Each family or single person is given a dated green card, termed a "quarantine" card, which states the name and age of each individual and the fact that said person is at the time free from quarantinable disease. The card is stamped by the representative of the service at the time of the first examination. Then upon the day of sailing, five days later, the "quarantine" cards are again produced, attached to the ship's ticket as a control, and after the examination of the passenger the card is stamped with a date stamp marked "Second inspection." All emigrants not having a quarantine card, those with a card not stamped and dated, or those ill or suspected of being ill, are recommended for detention in the city until the sailing of the next vessel, two weeks later. All passengers, cabin and steerage, are, for quarantine purposes, treated alike. A personal inspection of each passenger is made by the representative of the service throughout the five-day detention period. Written evidence from United States consular officers in any way relating to the previous whereabouts of an emigrant prior to arrival at Libau is always accepted.

Sanitary conditions in Libau.

Smallpox: Smallpox has assumed slightly epidemic proportions, especially during the months of May and June, 1910, as many as 18 cases occurring in one week. Since the beginning of May, as the result of a conference with the officials of the Russian-Amerika Line, all emigrants upon arrival in Libau were vaccinated by the ship physicians. The results were most unsatisfactory, as there was only about 1 "take" in every 30 persons vaccinated. A "feldscher" was then engaged by the steamship company, whose entire duty it was to vaccinate emigrants and members of the various crews of the ships. He was instructed by the service representative in the proper methods of vaccination. The results now obtained show great improvement, as only about 1 in every 30 vaccinations prove unsuccessful. It is the present intention to vaccinate emigrants during the entire year on account of the fact that smallpox is always present in Libau or in those parts of Russia from which the emigrants come.

An epidemic of smallpox was reported from Saratov March 23.

Health reports: A health report of the city of Libau is furnished the representative of the service each week. Other health reports and special reports of health conditions in Russia are taken from the various newspapers.

Cholera: Cholera has been present in Russia throughout the year, but in St. Petersburg no cases were reported between January 5 and June 22, 1910. Since then there have occurred 5 cases and 2 deaths. Cholera is most prevalent at the present time in the districts along the Don River. In Rostov alone, from June 18 to the 28th, there occurred 1,815 cases, with 612 deaths. It is chiefly present in the Governments of Minsk, Kiev, Orel, and Novotscherkassk, and is steadily spreading northward. It is present along the Dnieper, Don, and Volga Rivers. It is reported that Libau has been free from cholera for more than 30 years.

Plague: About 1,000 deaths from plague occur each year in the southeastern part of Russia, between the Volga River and the Ural Mountains. The epidemic this year occurred between December 1 and March 1. Plague remains endemic in this region because of the extreme ignorance of the people, who pay no heed to the instructions of the sanitary officials.

Typhus fever: In Riga an epidemic of typhus fever occurred in February. To date there have been over 1,200 cases, with a mortality of about 13 per cent. Epidemics have also been reported from Ofen-Pest (Hungary) and Charkov, Russia. It is present in almost every large city in Russia.

Rotten mouth: During the latter part of June mantfäule, or rotten mouth, appeared among the cattle in the Government of Poltava, and several other parts of Russia. The exportation and sale of animals from these districts have been prohibited. In Balachva there are over 1,000 cases, and a large number in Pavlograd, the Government of Witvsk, and the district of Ananjew.

CALCUTTA, INDIA.

Acting Asst. Surg. A. Smith Allen reports, during the fiscal year ending June 30, 1910, as follows:

Transactions.

Total number of vessels inspected	56
Total number of passengers examined	1,682
Total number of crews examined (European)	1,098
Total number of crews examined (Asiatic)	2,084
Number of vessels fumigated in accordance with quarantine regulations	56
Total number of Asiatic crews whose effects were disinfected	2,084
Total number of Asiatic passengers whose effects were disinfected	1,682

Destination and nationality of above vessels with number of crews and passengers.

Port.	Number of vessels.	Flag.			Cargo.	Steerage passengers.	Crew.		
		British.	German.	Danish.			White.	Asiatics.	Total.
Philadelphia and New York via Suez Canal.	13	9	4		General		250	523	773
Boston and New York via Suez Canal.	39	20	18	1	do		807	1,326	2,133
Demerara and Habana via Suez Canal.	2	2			do	1,682	21	144	165
Iloilo, Philippine Islands, via Singapore.	1	1			do		12	49	61
San Francisco via Singapore.	1	1			Ballast		8	42	50
Total	56	33	22	1		1,682	1,098	2,084	3,182

Bills of health.—The following precautions are taken at the port of Calcutta, India, prior to the granting of bills of health:

1. The holds of the vessels are fumigated with sulphur dioxide gas.
2. The vessels, when moored to wharves, are provided with rat guards on all lines.
3. The clothing and effects of the crews are disinfected.

Deaths from quarantinable diseases during the fiscal year.

	Cholera.	Plague.	Smallpox.	Leprosy.
1909.				
July	148	138	9	4
August	23	53	3	3
September	32	28	1	9
October	40	36	....	16
November	65	21	2	14
December	85	23	5	11
1910.				
January	210	35	2	10
February	192	76	7	9
March	265	149	7	4
April	338	325	14	6
May	235	286	6	3
June	116	105	1	1
Total number of deaths	1,749	1,275	57	90

Water supply.—The water supply, which is taken from the River Hughli, one of the outlets of the Ganges, continues to be uniformly good. Filtration is carried out at Pulta, 12 miles from the city, and the usual tests of purity are carried out weekly.

Health of the city.—The health of the city of Calcutta for the year was good, though not so good as during the last year. The death rate was 28.7, as against 28 for the past year. Portions of the city in which improved drainage had been completed showed that the death rate from malaria had fallen to about one-half of the previous rate. The death rate from cholera was considerably lower than in the preceding year, notwithstanding a fairly severe epidemic in March and April. An outbreak of beriberi occurred early in the year, the number of deaths being 433, of which no less than 283 occurred among women. The virulence of this disease has, however, decreased since the beginning of 1910.

NAPLES, ITALY.

Surg. H. D. Geddings reports as follows for the fiscal year ending June 30, 1910:

Transactions at Naples and Palermo, Italy.[1]

Months.	Ships.	Emigrants.		Baggage.	
		Naples.	Palermo.	Inspected.	Disinfected.
1909.					
July	20	8,693	917	2,660	11,648
August	16	6,641	909	2,395	9,235
September	28	11,690	2,203	4,910	15,355
October	24	10,167	1,476	3,829	14,170
November	22	7,916	1,517	4,329	11,497
December	19	6,126	775	2,469	8,145
1910.					
January	21	6,823	780	2,313	9,028
February	23	13,310	1,795	3,950	19,345
March	36	34,395	4,970	10,348	47,390
April	36	37,084	4,417	10,284	45,432
May	32	22,330	3,193	6,929	28,475
June	26	12,694	2,010	5,105	17,930
Total	303	177,869	24,962	59,521	237,650

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[1] A review of the cholera outbreak occuring in Italy and elsewhere during the calendar year 1910 will be found on pages 86 to 93.

Rejections recommended.

Months.	Trachoma.	Favus.	Suspected trachoma.	Suspected favus.	Measles.	Smallpox.	Other causes.	Total.
1909.								
July	272	19	220	4	....	2	102	619
August	187	17	145	1	....	....	62	412
September	421	35	240	4	....	1	127	828
October	423	23	241	4	....	1	120	812
November	411	31	265	4	....	....	79	790
December	228	16	135	1	....	1	65	446
1910.								
January	202	37	118	4	....	2	69	432
February	342	30	186	....	1	....	112	671
March	923	105	619	2	....	1	184	1,834
April	1,028	135	677	7	....	....	253	2,100
May	738	89	508	4	1	....	231	1,571
June	508	56	272	2	....	1	147	986
Total	5,683	593	3,626	37	2	9	1,551	11,501

Comparison with last two years.

Years.	Number of emigrants inspected.	Number of emigrants embarked.	Baggage.		Rejections recommended.
			Disinfected.	Passed.	
1907–8	121,897	114,673	141,643	38,879	7,224
1908–9	211,424	200,996	238,365	41,139	10,428
1909–10	214,332	202,831	237,650	59,521	11,501

Detentions.

The following were detained under observation, principally as being from ports and places where smallpox, cholera, or plague prevailed, and for the reasons specified in the table under the several headings:

Months.	Number of passengers.	Isolated for fever.	Vaccinated and held to await result.	Rejections recommended.					
				Trachoma.	Favus.	Aleppo boil.	Whooping cough.	Other causes.	Total.
1909.									
July	527	1	67	49	1	....	10	....	60
August	326	4	69	40	....	....	1	....	41
September	230	2	4	36	....	1	....	4	41
October	918	3	223	107	....	2	....	3	112
November	1,188	3	109	109	....	1	....	5	115
December	859	2	311	39	1	....	....	....	40
1910.									
January	101	....	42	11	....	....	....	....	11
February	357	....	67	13	....	....	....	....	13
March	1,975	....	588	38	1	1	....	7	47
April	1,254	1	326	22	....	....	....	8	30
May	1,053	1	226	28	2	....	1	3	34
June	784	....	59	28	1	....	....	2	31
Total	9,572	17	2,091	520	6	5	12	32	575

MEDICAL INSPECTION OF IMMIGRANTS.

In accordance with the immigration act of February 20, 1907, the medical inspection of all aliens arriving at the various ports in the United States, its possessions and dependencies, is conducted by officers detailed for that purpose.

During the fiscal year 17 commissioned officers and 60 acting assistant surgeons were assigned to this work exclusively. In addition a large number of officers, primarily detailed to other service duty, have examined aliens whenever presented to them.

Those officers of the service stationed at consulates for quarantine duty in Italy have also made inspections of departing aliens at the request of the Department of Commerce and Labor. This work has exceeded in volume and difficulty the quarantine function.

Medical inspection of alien immigrants is now being conducted at 79 stations.

During the fiscal year ended June 30, 1910, 1,280,957 immigrants were examined by medical officers of the service to determine their physical and mental fitness for entrance at ports in the United States and its dependencies, Porto Rico and Hawaii. During the fiscal year 30,780 aliens were certified for physical reasons.

The following table furnishes a summary of the transactions at the several ports in the United States and its dependencies and in Canada.

TABLE SHOWING NUMBER OF ALIENS INSPECTED AND CERTIFIED AT ALL PORTS AND PLACES IN THE UNITED STATES AND IN ITS DEPENDENCIES, AND IN CANADA.

	Number of aliens examined.	Number of aliens certified.					Important diseases for which certification was made.										
		Class A (I). Idiocy, imbecility, feeble-minded, epilepsy, insanity, and tuberculosis.	Class A (II). Loathsome contagious or dangerous contagious.	Class B. Disease or defect which affects ability to earn a living.	Class C. Disease or defect of less degree.	Total.	Trachoma.	Tuberculosis.	Insanity.	Idiocy.	Imbecile.	Epilepsy.	Feeble-minded.	Favus.	Syphilis.	Tinea tonsurans.	Gonorrhea.
Astoria, Oreg.	2,115	0	1	12	0	13									1		
Baltimore, Md.	31,623	7	48	33	676	764	46	3	2	2	1			2			
Bellingham, Wash.	43	0	0	0	0	0											
Boston, Mass.	70,447	23	36	2,363	337	2,759		4									
Blaine, Wash.	96			3	1	4											
Brownsville, Tex.	1,030	4	42	5	34	85											
Brunswick, Ga.	4	0	0	0	0	0											
Buffalo, N. Y.	2,917	5	72	42	0	119	68								1		2
Calexico, Cal.	483	4	0	1		5		4									
Charleston, S. C.	27	0	0	0	0	0											
Chicago, Ill.	25	1	16	0	0	17											
Cincinnati, Ohio.	8	0	0	0	0	0											
Del Rio, Tex.	809	3	5	87	0	95	4	1					3				
Detroit, Mich.	7,023	13	145	178	474	810	90	3				1	9		12	2	14
Douglas, Ariz.	631	2	0	1	0	3	2										
Duluth, Minn.	5,070	9	8	0	11	28	6	2	5				2				
Eastport, Idaho.	2,003	1	2	31	0	34		1						1			1
Eagle Pass, Tex.	6,643	7	28	27	0	62	17	2			3	2			10	1	
El Paso, Tex.	46,385	17	38	255	28	338	5	6	8	1			8		12		4
Everett, Wash.	84	0	0	0	0	0											
Fajardo, P. R.	0	0	0	0	0	0											
Fernandina, Fla.	0	0	0	0	0	0											
Galveston, Tex.	4,996	29	0	28	0	57											
Gloucester, Mass.	0	0	0	0	0	0											
Halifax, Nova Scotia.	7,651	3	280	231	0	514	279		1				2				1
Hidalgo, Tex.	439	1	2	1		4	2					1					
Honolulu, Hawaii.	5,204	1	74	30	0	105	69	1							5		
Humacao, P. R.	1	0	0	0	0	0											
Jacksonville, Fla.	0	0	0	0	0	0											
International Falls, Minn.	342	2	4	21	0	27		2									
Kahului, Hawaii.	0	0	0	0	0	0											
Ketchikan, Alaska.	378	0	0	0	0	0											

Key West, Fla.	2,468	0	0	2	0	2											
Laredo, Tex.	11,661	8	31	96	0	135	27		6	2		2			1		2
Lethbridge, Alberta, Canada	376	0	1	0	0	1	1										
Los Angeles, Cal.	1,685	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Malone, N. Y.	785	3	1	2	0	6		6							1		
Marcus, Wash.	1,029	1	2	45	0	48	2	1									
Mayaguez, P. R.	220					1											
Mobile, Ala.	113	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
Montreal, Canada	8,654	47	66	339	439	891	64	17	11	3	2	3	6	2			1
Naco, Ariz.	4,324	2	13	6	0	21	1										
New Orleans, La.	3,828	7	14	146	0	167	8	2	1						4		2
Newport News, Va.	0	0	0	0	0	0											
Newport, Vt.	330	6	2	19	0	27	1		1	1	1	1			1		
New York, N. Y.	912,026	279	1,735	9,351	8,180	19,545	1,442	32	116	11	39	13	100	84	13	94	32
Niagara Falls, N. Y.	6,073	7	81	82	14	184	72	1	2			1	3	3			3
Nogales, Ariz.	3,783	2	1	6	0	9			1			1			1		
Philadelphia, Pa.	40,096	24	111	550	507	1,192	106	13	5		4		2	3		2	
Pittsburg, Pa.	0	0	0	0	0	0											
Ponce, P. R.	469	1	0	0	0	1				1							
Portal, N. Dak.	773	1	0	5	0	6			1								
Port Arthur, Tex.	6,088	4	34	10	0	48	0	0	0	0					20		12
Port Huron Mich.	2,459	12	33	147	0	192	10	10	1		1	3	7	1	1		8
Portland, Me.	6,709	0	52	49	0	99	26							6			
Portland, Oreg.	1	0	0	0	0	0											
Port Tampa, Fla.	0	0	0	0	0	0											
Port Townsend, Wash.	9,906	0	45	43	0	88	21								11		13
Quebec, Canada	21,007	8	30	323	0	361	18		1	3	1		2				
Richford, Vt.	126	0	0	0	0	0											
San Diego, Cal.	706	0	2	0	0	2									1		
San Francisco, Cal.	11,437	3	632	454	0	1,089	631	1	2								1
San Juan, P. R.	2,436	0	4	1	0	5	4										
Savannah, Ga.	16	0	0	0	0	0											
Seattle, Wash.	2,281	2	46	23	0	71	5	2							2		2
St. John, New Brunswick	3,406	4	5	28	0	37	5				1		2				
Sault Ste. Marie, Mich.	1,858	6	20	138	0	164	9	1								1	1
Sumas, Wash.	1,461	3	41	20	0	64	41	1	3						2		3
Tacoma, Wash.	1,308	4	68	4	0	76	64	4							4		
Tampa Bay quarantine, Fla.	4,342	9					7	1							1		
Tucson, Ariz.	130	4	3	2	2	11			2				2		3		
Vancouver, British Colombia	2,598	9	60	59	0	128	59	7	1				1				1
Victoria, British Columbia	1,544	1	0	0	18	19		1									
Wilmington, N. C.	6	0	0	0	0	0											
Winnipeg, Canada	5,964	17	7	180	39	243	2	9	2			4	2		3		
Total	1,280,957	606	3,937	15,480	11,760	30,780	3,220	140	152	24	53	32	151	102	110	100	103

Revised Book of Instructions for the Medical Inspection of Aliens.

The revised book of instructions for the medical inspection of aliens was issued for enforcement on February 1, 1910, having received departmental approval on January 18, 1910.

The board consisted of Asst. Surg. Gen. H. D. Geddings, chairman, Surg. George W. Stoner, Passed Asst. Surg. J. W. Schereschewsky, and Acting Asst. Surg. M. V. Safford, recorder.

The revision was the result of much careful work, both on the part of the board of medical officers convened twice for that purpose, and on the part of the bureau on which the task of coordinating the instructions with existing laws, regulations, and customs devolved.

The Detail of a Medical Officer to Accompany the Special Agent of the Hawaiian Territorial Board of Immigration to Madeira and the Azores to Examine Intending Emigrants Before Embarkation.

In compliance with a request made by the governor of the Territory of Hawaii, a medical officer of the service was detailed on August 28, 1909, to join the Hawaiian Territorial immigration agent in London, and to accompany him to Madeira and the Azores for the purpose of making medical examinations of all intending emigrants before their embarkation for Hawaii. It was intended by this means to avoid the acceptance at the port of embarkation of any emigrant who, by any mental or physical defect, might be disqualified from landing at Hawaii under the Federal immigration laws.

Of 869 emigrants inspected prior to their departure from Funchal, Madeira, on October 26, 1909, 17 were recommended for rejection, and the physical condition of 39 noted.

The emigrants were enrolled in all parts of Madeira and San Michaels.

Excerpts from Reports Made by Service Officers Detailed for the Medical Inspection of Immigrants.

BALTIMORE, MD.

Passed Asst. Surg. J. W. Schereschewsky, through the medical officer in command, reports that while the number of aliens arriving during the fiscal year ended June 30, 1910, was greater than for the fiscal year ended June 30, 1909, the volume of work at Baltimore is still considerably below the normal on account of the fact that a number of North German Lloyd steamers have of late been diverted from Baltimore to Philadelphia.

The character of the immigration at Baltimore differs from that at New York and Philadelphia on account of the fact that it is not the result of so much organized effort on the part of immigration agents in foreign countries.

This fact is demonstrated in the relatively small proportion of "Baltimore-landed" immigrants deported, subsequent to their landing, under the one, two, and three year clauses of the immigration law. During this fiscal year only one-tenth of 1 per cent of such deportations was effected. During the year 421 aliens received treatment in hospitals, with a mortality of one-tenth of 1 per cent.

BOSTON, MASS.

Acting Asst. Surg. M. V. Safford, through the medical officer in command, reports the following:

During this fiscal year 392 passenger ships subject to the local immigration examination[1] arrived at this port, bringing a total of 70,447 passengers. During the months of January and February the arrivals of both ships and passengers calling for local examination was the smallest for many years and was due to exceptional emergencies, which obliged both the International Mercantile Marine and the Cunard Lines to withdraw ships temporarily from the Boston trade to meet more urgent demands of their service elsewhere. During these two months there were but 21 and 20 passenger ship arrivals, respectively. For the other months of the year the arrivals were over 30 and reached 40 for the month of May.

With respect to citizenship and classification on shipboard, the 70,447 passengers were divided as follows:

TABLE A.

Class.	United States citizens.	Aliens.	Total passengers.	Proportion of United States citizens.
				Per cent.
First cabin	3,932	1,198	5,130	76
Second cabin	2,501	11,244	13,745	18
Steerage	2,594	48,922	51,516	5
Stowaways	17	39	56	....
Total	9,044	61,403	70,447	13

The percentage of American citizens shown above is the average for the entire year. During the autumn months the percentage in the second cabin exceeds considerably this average. It is also to be noted that the cabin passengers, which are always examined on shipboard, equal approximately about 25 per cent of the number in the steerage, which are usually examined after debarkation at the docks of the various steamship lines.

The number of alien passengers certified for "physical and mental defects and diseases" is shown in the following:

TABLE B.

Classification on shipboard.	Number of alien arrivals.	First-class certificates [2]	Second-class certificates. [2]	Total certificates.	Ratio certified.
First-cabin aliens	1,198	8	5	13	1.92
Second-cabin aliens	11,244	149	586	735	1.15
Steerage aliens	48,922	412	1,584	1,996	1.25
Stowaways and alien seamen	....	7	8	15	....
Total	....	576	2,183	2,759	....

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[1] Ships and passengers from British-American ports are examined at the foreign port of departure and are not included within the scope of this report.

[2] For distinction between first and second class certificates in vogue at this port, see annual report for 1906.

As appears in the above, nearly 7 per cent of the second-cabin and a little more than 4 per cent of the alien steerage passengers arriving during the year were certified for physical and mental defects or diseases either specifically excluded by law or of such a character as, in the opinion of the medical officer, to raise the question of capacity for self-maintenance. Minor defects regarded by the medical officer of little or no practical importance are not included in the above figures. Notations calling the attention of the immigration inspectors to defects of this sort were issued by the medical officers to an additional number of about 2,200 during the year.

One hundred and forty-seven arriving aliens were sent to hospitals, recourse having been had to different institutions for this purpose, and in addition about 500 cases were held for treatment of minor ailments at the station itself. Early in the year a special contract was made with the Massachusetts State authorities whereby prompt and suitable hospital treatment for arriving insane aliens is afforded.

The new immigration examination hall at Pier 3, East Boston, now being used for the examination of the steerage passengers of both the Cunard and Navigazione Generale lines, is said to offer a larger floor space for general examination purposes, better light, better arrangement of inspection aisles, and more convenient arrangement of detention inclosures and examination rooms for the medical examination than any other inspection station.

The employment of a special clerk and stenographer to assist at the medical examination has served to relieve the medical officers of clerical duties which inevitably tend to detract from the efficiency of the medical examination itself.

Method of inspections.—On January 1 an entirely new system of making the medical examination was put into effect. This has reduced the clerical work at least one-half. One feature of this system is a special copying device which reproduces at once on a special card a carbon copy of any certificate or notation issued—the card serving as the permanent record of the case.

At the time of the primary medical inspection of the passengers a medical officer, together with a clerical assistant, is stationed in the detention inclosure alongside the medical inspection aisle. Another officer makes the actual line inspection, devoting himself exclusively to the detection of suspicious conditions, and turns such suspect directly over the officer within the inclosure, indicating to him orally the features in the case which attracted attention. This latter officer makes at once such examinations as may be attempted on the spot, disposes of such cases as can be disposed of forthwith, dictating any necessary certificates, notations or "detention cards," and segregates other cases, making such memoranda as may be calculated to facilitate their subsequent examination. Under the operation of this system it has been found possible for two medical officers, working as above indicated, to handle 1,800 steerage passengers without interrupting the line inspection, turn aside for special examination over 15 per cent of this number, and after the line inspection is finished to find remaining only a convenient number whose proper examination will necessitate removal to the medical examination rooms.

Trachoma.—During the past two winter seasons Acting Asst. Surg. Riemer has devoted considerable attention to the study of the pathology of trachoma at the laboratory of the Massachusetts Eye and Ear Hospital, especially with reference to the practical diagnostic value of the Halberstaedter and Prowazek bodies in inspection work. It is his intention to make his conclusions the subject of a special report.

Types of diseases encountered.—The work of the medical examiners at Boston for the year shows that so far as that port is concerned the number of cases of diseases, the bringing of which is subject under the law of 1907 to a penalty of $100, is still continuing to diminish. For some reason, possibly accidental, the number of cases of acute exanthematous diseases has likewise steadily decreased at Boston during the past five years. There are indications also that immigrants are now bringing diseases not commonly observed, and to the detection of which special attention is being generally directed. Cases of relapsing fever and Malta fever have been admitted to the hospital during the year. It also seems probable that anchylostomiasis is destined to become common among immigrants from certain localities. It has been made here a routine practice to make a microscopical examination of the blood of all persons who appear pale or cachectic. The finding of an easinophilia in this connection has been regarded as suggestive of uncinariasis, and in these cases hookworms have been invariably found on careful examination.

There is prevalent among immigrants from certain parts of Macedonia a chronic enlargement of the spleen which it has been assumed was due to malaria. There are indications, however, that this condition is probably due to some other and unknown cause. A careful examination of the fingers of immigrants arriving on recent ships makes it apparent that favus of the finger nails, apart from involvement of the scalp, is a much more common affection than has hitherto been supposed.

As appears in the tabulated portion of this report, diseased and defective immigrants tend to come in the cabin, and owing to the time-honored practice of permitting so-called second-cabin passengers to be examined aboard ship the examination of aliens taking passage in this way presents the most serious practical problem with which the examining medical officers have to contend. Prevailing conditions not merely concern the enforcement of the immigration laws but are of interest in connection with the enforcement of quarantine laws and regulations as well. (See annual report for 1909.)

At Boston, at least, the proportion of diseased and defectives among the total arrivals has not appreciably changed in recent years.

Landed cases.—The general character of the conditions which cause aliens to become inmates of public institutions within a short time after arrival will appear from the table given below. All these are cases reported by the State authorities of the State of Massachusetts alone, and as public charges in institutions under State control. Similar cases reported in other ways and from other States would probably bring the total number of such cases officially handled through the Commissioner of Immigration at Boston in the course of the year up to about 550. All such cases are investigated by an immigration inspector, but personal investigation by the medical officers of the service at Boston has thus far been avoided in the vast majority of these cases by Commissioner Billings' policy of declining to transmit the papers in any case to the department until the medical evidence submitted by the officers of the institution concerned shall appear to be sufficiently complete and explicit as to enable the Secretary to determine without further testimony whether the case shall be ascribed to "causes existing prior or arising subsequent to landing." Roughly speaking, about one-half of the aliens arriving at Boston are destined to Massachusetts and about one-half of all arriving aliens giving Massachusetts as their destination come through the port of Boston.

TABLE C.

Aliens reported as public charges by Massachusetts State authorities.

Disease.	Total.	Less than one year in United States.	More than one year in United States.	Landed at port of Boston	Landed at port of New York.	Entered at other ports.
Appendicitis	11	11	....	7	4	....
Abscess	1	1	....	1	....	....
Abscess of kidney	1	1	....	....	1	....
Abscess of liver	1	1	....	....	1	....
Anemia	1	1	....	1	....	....
Bronchitis (acute)	4	4	....	3	....	1
Catarrhal jaundice	1	1	....	1	....	....
Cerebral syphilis	1	1	....	....	1	....
Diphtheria	13	12	1	4	8	1
Diabetes	1	....	1	....	1	....
Debility	1	1	....	1	....	....
Epilepsy	4	3	1	1	3	....
Erysipelas	8	8	....	6	1	1
Eczema	1	1	....	1	....	....
Empyema	2	2	....	1	1	....
Feeble-minded	1	....	1	....	....	1
Gonorrhea	6	6	....	1	4	1
Gastric ulcer	2	2	....	....	2	....
Hernia	3	3	....	2	1	....
Hemorrhoids	1	1	....	....	....	1
Hemorrhage	1	1	....	1	....	....
Hyperchlorhydria	1	....	1	....	1	....
Insanity	99	49	50	32	44	23
Malaria	1	....	1	....	1	....
Measles	6	6	....	3	3	....
Meningitis	2	2	....	1	1	....
Mastoiditis	3	3	....	2	1	....
Nephritis (acute)	2	2	....	....	1	1
Nephritis (chronic)	1	1	....	1	....	....
Neurasthenia	1	1	....	....	1	....
Pneumonia	24	24	....	11	12	1
Pernicious vomiting	1	1	....	....	1	....
Pleurisy	7	7	....	2	4	1
Pregnancy	13	12	1	8	4	1
Pulmonary tuberculosis	31	31	....	13	14	4
Peritonitis	2	1	1	1	1	....
Peritonitis (tubercular)	1	1	....	1	....	....
Results of accidents and acute injuries	63	61	2	31	28	4
Rheumatism	25	25	....	12	12	1
Scabies	3	3	....	1	1	1
Scarlet fever	12	12	....	6	4	2
Smallpox	3	3	....	1	2	....
Salpingitis	2	1	1	....	2	....
Sciatica	1	1	....	1	....	....
Typhoid fever	22	21	1	11	11	....
Tonsillitis	2	1	1	2	....	....
Tumor	2	1	1	1	1	....
Tuberculosis hip joint	1	1	....	....	1	....
Tuberculosis of knee	1	1	....	....	1	....
Tuberculosis glands of neck	1	1	....	....	1	....
Ulcer (chronic)	1	1	....	....	....	1
Valvular disease of heart	5	5	....	2	2	1
Total	404	340	64	174	183	47

The above table may be assumed to include a very large proportion at least of aliens less than three years in the country who became inmates of insane asylums within the State of Massachusetts during the fiscal year, but the total number reported as public charges from other causes probably does not represent 20 per cent of the actual number of such aliens who became public charges in the State by reason of physical disabilities during the same period. The various diseases and disabilities appearing in the table may, however, be taken as fairly indicating the usual causes which bring adult aliens into public institutions.

In connection with these insanity cases it may be observed that the local official records show that 82 were deported as being due to causes existing prior to landing. Over nine-tenths of the total cases reported were regarded as dementia precox. In a number of instances investigation showed that the individuals had been detained as mental suspects at the time of arrival and subsequently either passed by the medical examiners or certified for something which did not offer an effective obstacle to their admission. An investigation into the probable condition of such cases at time of arrival tends to show that it is at present a rare occurrence for an alien who is demonstrably insane on arrival to escape detection and proper certification. The cases reported as insane after landing are recruited rather from the degenerate and psycopathic types, which are so conspicuous and numerous among immigrants. Such individuals are held up freely for mental observation, but in not more than one case in six is any tangible mental defect found which will justify a medical certificate. Moreover, as may be inferred from Table C, certification for anything short of a statutory ground for exclusion is unlikely to operate to prevent the alien's admission. Next to insanity, pulmonary tuberculosis is the disease most often reported by the Massachusetts State authorities. The records indicate, however, that only about 30 per cent are deemed deportable from prior causes, even construing the term "causes" very broadly.

There is every prospect of increased work for the service at Boston in the immediate future. Early in the past winter the Navigazione Generale began a passenger service between the Italian ports and Boston, and the success which this venture has met makes it probable that this company will increase the number of ships on the above-mentioned route. Recently the White Star Line placed a new ship in its Liverpool-Boston service, and this is to be followed by still another new vessel. The Cunard Line is also building a new ship for the Liverpool-Boston route. The Boston & Albany Railway Co. is expending $4,500,000 for new docks and terminal facilities at East Boston, and the State of Massachusetts has just appropriated $3,000,000 for a similar purpose in the same vicinity.

EL PASO, TEX.

Acting Asst. Surg. J. W. Tappan reports that the total number of aliens inspected during the fiscal year was 46,385, of which 328 were found to be suffering from disease, defective, or likely to become public charges on account of physical defects.

Under Class A of the revised "Instructions for the Medical Inspection of Aliens" 45 were certified as follows: Syphilis, 12; trachoma, 5; tubercle of lungs, 6; gonorrhea, 4; insanity, 8; feebleminded, 8; idiocy, 1; leprosy, 1. Under Class B 255 were certified and were deported by the immigration officials. Under Class C 28 certifications were made and 12 of these were deported. The records show but 16 admissions over the medical officer's certification in Class C, and not any in Classes A and B.

The reason for this comparatively small percentage of certificate cases is the fact that fewer aliens, other than Mexican, are presenting themselves at El Paso for examination; that Mexican medical examiners at Mexican ports of entry are rejecting many aliens whom, previously, they would have admitted, and that the majority of applicants for admission are healthy Mexican laborers from the interior, who, as a rule, are of fair physique.

The decrease of favus and trachoma at El Paso and throughout the district is exceedingly gratifying and may be ascribed to the same causes and to the fact that aliens rejected at the larger ports of entry are now made aware that the medical inspection on the border, even should they be able to enter Mexico, is no less strict than that of the larger ports.

During the fiscal year the offices of the supervising inspector of the Immigration Service, for the Mexican border district, were removed from San Antonio to El Paso, thus concentrating the work at El Paso and making that station one of the most important immigration centers in the United States, this district now comprising the whole Mexican border from the Gulf of Mexico to the Pacific Ocean. The medical officer of the service supervises the sanitation of the immigration building, has medical charge of detained aliens, and acts in an advisory capacity to the supervising inspector on matters pertaining to medical subjects for the entire district.

In previous years, at the request of the Immigration Service, the bureau has detailed the medical officer at El Paso to make an inspection of the Texas-Mexican and Arizona-Mexican borders, visiting each immigration station, observing the methods of the medical officers, and instructing them in their duties and in the methods that obtain at Ellis Island for the medical inspection of aliens. This year, owing to the uniformity and high standard of the medical inspection at the various stations in the district, such a trip was not deemed necessary and all instruction pertaining to medical inspection was handled from El Paso by correspondence.

LAREDO, TEX.

Acting Asst. Surg. H. J. Hamilton reports as follows:

The demand for labor throughout Texas, caused by the increase in railroad construction and the increased demand for farm laborers, has stimulated the influx of immigrants during the year over the Texas-Mexican border. The application for admission at Laredo of Poles, Greeks, Russians, and Syrians has been steadily decreasing for the past three or four years.

Trachoma.—The number of immigrants certified for trachoma has likewise decreased. During the fiscal year ended June 30, 1906, 115 immigrants were certified for trachoma; during the period ended June 30, 1907, 119 immigrants were certified for this disease; during the period ended June 30, 1908, 41, and during the period ended June 30, 1909, 19 immigrants were so certified. During the year ended June 30, 1910, 28 immigrants were certified for trachoma. This increase of trachoma certificates over last year is due to the fact that more Mexicans have contracted this disease, and not that the number of Asiatic and European immigrants have increased.

The inspection of immigrants by the Mexican authorities is having the effect of deterring diseased Asiatics and Europeans from applying for admission at Laredo. Besides, it is probably becoming generally known in the countries whence these immigrants originate that they must submit to inspection before entering the United States from Mexico. Formerly, immigrants were deceived by the agents of steamship companies running to Mexico, who lead them to believe that once in America all inspection ceased and that Mexico was a part of America.

MONTREAL, CANADA.

From the report of Passed Asst. Surg. E. H. Mullen the following is taken:

Montreal is situated at the far navigable point for sea-going vessels on the St. Lawrence River. At this port 150 passenger steamers enter and clear annually. It is an important railroad center, being the terminus of various roads which cross the American border, such as the Delaware & Hudson Railroad, Rutland Railroad, Central Railroad of Vermont, and the Boston & Maine Railroad. The headquarters of the Canadian Pacific and Grand Trunk Railroads, two transcontinental lines, are also located in this city. These railroads connect Montreal with Quebec, Halifax, Portland, and other eastern seaports. Therefore, diseased and undesirable Europeans who may have by any means succeeded in entering Canada, or who may have acquired undesirability after entering, will in all probability make their first attempt to cross the American line at Montreal.

Canadians and others from all parts of the Dominion of Canada who are afflicted with tuberculosis and who are proceeding to the famous Saranac region on account of ill health, must pass through this city or its immediate vicinity.

During the past 20 months cases of marked hallucinosis and advanced general paralysis are reported to have applied for the necessary passports to enter the United States.

For the above reasons the immigration station at Montreal is an important one, especially from a medical standpoint. Many aliens who are certified for serious conditions are in transit through the United States to various parts of Europe and to the West Indies. This is particularly true in the fall of each year when a large number of Italian aliens are passing through on their return to Italy.

Methods of inspection.—When immigrants are presented for inspection, an immigration official conducts them into the office of the medical officer and furnishes a blank certificate for each alien. These certificates are signed at the conclusion of the examination whether the alien is certified or passed.

The medical officer takes his position near a window facing the entrance. If a number are to be inspected the examiner opens the chest clothing of the first to be examined and directs the others to do likewise, and to pay strict attention and follow their leader.

The inspection proper.—Vision: The alien is directed to look at an object a little to the left of the medical officer to throw good light on the pupils and eyeballs, so that all ocular defects may be carefully observed. The pupillary light reflex is quickly tested by placing the palm of the examiner's hand in front of the immigrant's eyes and then quickly withdrawing it.

In observing the pupils special care is taken to detect inequalities, irregularities, and myosis.

Eyelids: The upper eyelids are then everted. The principal object of this procedure is to determine the presence or nonexistence of trachoma.

Scalp: The alien's head is bent anteriorly so that the scalp may be thoroughly inspected and palpated. This, in many instances, has revealed a number of conditions which would otherwise have escaped notice. Tumors, elevations, and depressions of the cranium, if present, are detected. Favus, ringworm, and other contagious skin conditions are discovered if present.

Hands: The alien then presents both dorsal and palmar surfaces of his hands for careful scrutiny. The hands often furnish important objective signs of disease of respiratory and vascular systems, impaired nutrition and mentality. Cutaneous eruptions are searched for and deformities and paralyses noted.

Groin: With a finger in the external abdominal ring the alien is directed to cough. A relaxed ring or actual hernia is detected if present.

Chest and abdomen: With a stethoscope the heart and lungs are auscultated, while the thoracic and upper abdominal regions are quickly inspected for asymetry, tumors, ascites, etc.

Gait: Finally, the alien is instructed to turn and walk to the adjoining waiting room, thus giving the examiner a view of the back. Attention is particularly paid to posture, attitude, gait, etc. The gait may disclose slow or defective muscular coordination, degenerative spinal changes, such as locomotor ataxia, spastic paraplegia, etc.

While a detailed description of this physical examination is perhaps long, the actual time consumed in the inspection of each alien is short, about 10 seconds being taken in each case.

Mental examination: If an alien displays any symptoms indicative of mental disease, he is subjected to a further mental examination. The medical officer exchanges a few words with many of the English-speaking aliens in order to obtain a fair idea of their mental poise.

An interpreter is present at this primary inspection, and when any alien does not appear to understand what is wanted of him he is at once taken aside by the interpreter, who submits him to any one of the following mental tests according to the direction of the medical officer: Orientation, memory, defective test, hallucination, or persecutory.

When an alien is held for suspected mental disease the accompanying relatives or friends, if any, are separately questioned as to the actions and statements of the suspect. Considerable pertinent information is often obtained in this way.

In the mental examination such stigmata of degeneration as stupidity, lack of comprehension, forgetfulness, verbigeration, impulsive or stereotyped actions, abnormal attitudes, negativism, hallucination, awkwardness, mannerisms, and other eccentricities will suggest defective mentality, dementia prœcox, and other dementias.

Striking peculiarities in dress, talkativeness, witticisms, unruliness, egotism, unusual laughing or boisterousness will suggest forms of maniac disease.

Slow speech, faulty articulation, sad facies, and physomotor retardations in general will suggest a depressive mania.

Untidiness, intoxication (real or apparent), dullness, tremor, ataxia, stuttering speech, unusual calmness or joviality, ideas of grandeur, defective memory, disorientation, etc., will suggest general paralysis of the insane or alcoholism.

All aliens over 60 years of age who are at all excitable, unruly, or confused are questioned as to orientation, memory, and ideas of persecution, in order to unmask senile dementia if existing.

Excessive agitation in middle-aged women furnishes cause for their examination to exclude involution melancholia.

Aliens from emotional races, who become easily frightened or who are startled easily or who cry and sob are examined carefully for hysterical conditions. The symptons of hysterical nervousness should not be mistaken for more serious mental states. In this class, disturbances of the cutaneous sensations hemianaesthesia), the pharyngeal reflex, history of globus hystericus, hemicrania, convulsions, and other hysterical manifestations are sought for.

NEW YORK (ELLIS ISLAND IMMIGRATION STATION).

Surg. George W. Stoner, chief medical officer, reports the following:

Nine hundred and twelve thousand and twenty-six aliens were examined upon arrival, including 170,436 cabin and 741,590 steerage passengers. In addition to the large number of aliens there were 170,208 passengers (139,683 cabin and 30,525 steerage) who, upon further examination by the immigrant inspectors, proved to be citizens of the United States.

Nineteen thousand five hundred and forty-five aliens were certified for physical or mental defects, as per tabulated statement herewith, including 1,735 classified as loathsome contagious or dangerous contagious, viz, trachoma 1,442, tinea tonsurans 94, favus 84, tuberculosis 32, syphilis 13, gonorrhœa 32, venereal ulcer 19, sycosis 7, blastomycosis 1, leprosy 1, and 279 mentally diseased, viz, insane 116, feeble-minded 100, imbecile 39, epilepsy 13, and idiot 11.

Nine thousand three hundred and fifty-one were certified for disease or defect which affects ability to earn a living, including senility

2,637, hernia 1,478, lack of physical development 657, arteriosclerosis 461, varicose veins 399, valvular disease of heart 384, poor physical development 373, curvature of spine 310, chronic inflammation of lymph glands of neck 242, ankylosis of joints 172, goiter 116, defective vision 114, psoriasis 101, lupus 49, and numerous other affections, as set forth in tabulated statement; and 8,180 were certified as hereinafter tabulated, for disease or defect of less degree.

Eight thousand six hundred and forty-nine arriving immigrant aliens were admitted to hospitals as follows:

Immigrant Hospital, Ellis Island, N. Y.	8,042
Health Department Hospital, New York City	315
St. Mary's Hospital, Hoboken, N. J.	225
St. Vincent's Hospital, New York City	37
Long Island College Hospital, Brooklyn, N. Y.	23
Columbus Hospital, New York City	7
Total	8,649

Two hundred and seventy-nine immigrant patients were on hand in the several hospitals at the beginning of the fiscal year, making a grand total of 8,928 (including men 4,917, women 2,041, male children 12 years of age or under 1,100, female children 12 years of age or under 870), furnished hospital care and treatment.

Twenty-eight men, 12 women, 24 male children, and 22 female children (total 86) died in hospital during the year. Sixteen children (6 male and 10 female) were born.

Of the number cared for in hospitals of the New York City health department and St. Mary's Hospital, Hoboken, N. J., 450 were admitted on account of acute contagious disease, including measles, 224; scarlet fever, 55; mumps, 48; chicken pox, 45; erysipelas, 44; diphtheria, 18; whooping cough, 11; smallpox, 3; and cerebro-spinal fever, 2.

The comparatively small number of acute contagious diseases treated in immigrant or contract hospitals this year is due to the fact that since November last all incoming aliens afflicted with such disease have been removed from ship at the entrance of the harbor by the health officer and detained for care and treatment in the State quarantine hospital, and during the same period 652 cases occurring at Ellis Island, including 118 accompanying (exposed persons), have been turned over to the same care and treatment pending the opening of the contagious-disease hospital at Ellis Island for the reception of patients.

Of the 279 mentally diseased aliens certified, 257 were admitted to immigrant hospital, and, in addition to these, 124 insane (warrant cases) were cared for in the hospital temporarily, making a total of 381 for the year.

The new wing of the immigrant general hospital (Island No. 2) was opened for reception of patients near the close of the fiscal year (June, 1910), and since then all arriving aliens requiring hospital care have been admitted to the new wing, and, so far as practicable, patients in the old hospital building have been transferred to the new, so as to permit of a better method of cleansing the different compartments of the old hospital than was possible while the building was constantly crowded.

Disposition of cases certified during the year, including cases pending from preceding year.

	From preceding year.	Certified during year ended June 30, 1910.	Total.	Deported.	Landed.	Remaining.
CLASS I.						
Insane	4	116	120	103	15	2
Feeble-minded	2	100	102	101		1
Imbecile	1	39	40	33	6	1
Epileptic		13	13	10	2	1
Idiot		11	11	7	3	1
Total	7	279	286	254	26	6
CLASS II.						
Loathsome contagious or dangerous contagious:						
Trachoma	31	1,442	1,473	1,379	54	40
Tinea tonsurans	5	94	99	91	6	2
Favus	2	84	86	82	4	
Tuberculosis		32	32	24	8	
Gonorrhea		32	32	29	2	1
Venereal ulcer		19	19	19		
Syphilis		13	13	13		
Sycosis		7	7	7		
Tinea unguium		6	6	6		
Tinea barbæ		3	3	3		
Carcinoma of mouth		1	1		1	
Blastomycosis		1	1	1		
Leprosy		1	1	1		
Total	38	1,735	1,773	1,655	75	43
CLASS III.						
Disease or defect which affects ability to earn a living	58	9,351	9,409	4,022	5,219	168
CLASS IV.						
Diseases or defect of less degree	68	8,180	8,248	718	7,504	26
Grand total	171	19,545	19,716	6,649	12,824	243

Information relative to cases of the different classes landed.

CLASS I.

Landed, United States citizen or United States born	11
Landed, on appeal	9
Landed, on bond	4
Died	2
Total	26

CLASS II.

Landed, United States citizen or United States born	29
Landed, on appeal	32
Landed, on bond	2
Landed, after treatment in hospital, recovered	10
Escaped	1
Died	1
Total	75

CLASS III.—DISEASE OR DEFECT WHICH AFFECTS ABILITY TO EARN A LIVING.

Landed, United States citizen or United States born	7
Landed, on appeal	123
Landed, on bond	106
Landed, by board of special inquiry or by immigrant inspectors	4, 969
Escaped	1
Died	13
Total	5, 219

CLASS IV.—DISEASE OR DEFECT OF LESS DEGREE.

Landed, United States citizen or United States born	1
Landed, on appeal	22
Landed, on bond	9
Landed, by board of special inquiry or by immigrant inspectors	7, 469
Landed, after treatment in hospital, recovered	1
Died	2
Total	7, 504

Summary of hospital transactions for fiscal year ended June 30, 1910.

Number of patients in hospitals at beginning of year	279
Patients admitted to hospital during year	8, 649
Total treated: men, 4,917; women, 2,041; male children, 1,100; female children, 870; total	8, 928
Patients admitted to hospital during year	8, 649
Births: Male, 6; female, 10	16
Deaths: Men, 28; women, 12; male children, 24; female children, 22	86
Pay patients treated during the year	8, 600
Free patients treated during the year	328
Days' treatment for pay patients	56, 157
Days' treatment for free patients	2, 402
Total days' treatment for hospital cases	58, 559
Daily average number of patients in hospital	160
Patients in immigrant hospital at end of year	98

Hospitals.	From previous year.	Admitted during year.	Total treated.	Recovered.	Improved.	Not improved.	Died.	Remaining at end of year.	Days' treatment.
Immigrant	143	8,042	8,185	3,190	2,282	2,575	40	98	43,386
Health department	71	315	386	359	....	....	27	......	7,970
St. Mary's Hospital	60	225	285	262	7	4	12	......	6,026
Long Island Colored Hospital	2	23	25	20	1	2	2	......	412
St. Vincent's Hospital	1	37	38	25	....	8	5	......	600
Columbus Hospital	2	7	9	9	....	....	......	......	165
Total	279	8,649	8,928	3,865	2,290	2,589	86	98	58.559

Besides the number of aliens admitted to immigrant and contract hospitals during the year, 271 requiring immediate attention on arrival at docks were cared for by the different steamship companies in hospitals of their own selection in the city. Of these 221 recovered, 12 died, and 38 were remaining on hand at the close of the fiscal year.

One hundred and sixty-seven alien immigrants who had become public charges or inmates in State or local hospitals and institutions in New York, New Jersey, and Connecticut were visited and examined during the year by medical officers at this station to determine the nature of the disease, mental or physical, from which the aliens were suffering and whether due to causes existing prior to landing in the United States; and a medical certificate in each case was rendered for the information of the Commissioner of Immigration.

PHILADELPHIA, PA.

Passed Asst. Surg. Taliaferro Clark reports through the medical officer in command that the number of immigrants seeking admission through the port of Philadelphia was 40,096, being an increase of 24,821 over the preceding year. This marked increase was, in part, due to the establishment of a direct service between this port and Bremen, the third line at present bringing passengers from European ports to Philadelphia.

In comparison with other ports, the number of aliens traveling first and second cabin to Philadelphia is small, being 2,520 against 37,582 in the steerage.

Certificates of disability were issued against 47 aliens traveling as saloon passengers, 13 being for trachoma, of whom 9 were deported, and 1 feeble-minded, also deported.

A total of 1,192 certificates and notations of disability were issued for the information of the Commissioner of Immigration, resulting, 146 deportations, as follows: Dangerous contagious diseases, 90; insanity, idiocy, epilepsy, and feeble-minded, 11; loathsome diseases, 4; likely to become public charges, 41.

Trachoma.—Trachoma still heads the list of deportations. It is of interest to note the arrival on one vessel in April last of 35 cases of acute trachoma, the origin of which could not be determined. Smears were taken from each of those cases for microscopic examination, and the presence demonstrated in the majority of these cases of the intracorpuscular bodies described by Profs. Greef, Frosch, and Clausen, of the Prussian Commission for the Investigation of the Origin and Development of Trachoma.

Many thousands of cases of trachoma under treatment are awaiting in European ports for admission to this country. That 67 cases of cicatricial lids (old trachoma) were observed during the year would seem to substantiate this report. Dr. Clark advises that such cases should be admitted only on bond. With advancing years the flow of plasma through the corneal structures is impeded, and those tissues are less resistent to irritation by reason of deficient nourishment, hence a diffuse keratitis, clouding of the cornea, and marked deficiency in vision, even blindness, may result, and the victim likely to become a public charge.

Fines in the sum of $2,700 were imposed under section 9 of the immigration law.

During the fiscal year 527 discharged foreign seamen were examined in accordance with immigration practices. In addition, 1,111 desertions were reported. Suspicion was attached to a particular vessel by reason of the number of desertions therefrom on each visit to this port. Accordingly, it was decided to muster and examine its crew on the next visit before allowing her to proceed to her dock. Six cases of trachoma were discovered in a crew of 26. Subsequent legal action revealed the fact that the traffic was assisting rejected aliens to land in this country in violation of law. Taking into consideration that over 30,000 deserting seamen are reported each year, it is easy to appreciate a means whereby recruits are yearly added to the trachoma clinics of the country.

Landed cases.—The investigation and certification of landed cases reported by the various hospitals of Philadelphia and contiguous cities occupies the whole time of one of the medical officers assigned to immigration duty at that port. During the fiscal year just ended 458 such cases were investigated, involving 8,640 days' treatment, an average of 18.86 days for each alien. Of these 46 were deported, 30 died, and 16 were pending deportation orders at the close of the year. In addition to the aforementioned hospital cases, 190 were sent direct from the landing stations to the hospital, of whom 13 died.

No diagnoses were appealed during the year. On the other hand, appeals were submitted, on legal and humanitarian grounds, in 27 medical cases, of which 9 were dismissed, 6 are pending, and 14 were sustained.

New station.—Within the year a site was purchased for an immigration station on the New Jersey side of the Delaware River, in the city of Gloucester, which is sufficiently large not only for the examination and detention of immigrants, but also for the erection of hospitals sufficiently commodious to care for the sick among them and the establishment of suitable laboratories, so urgently needed at Philadelphia.

SAN FRANCISCO, CAL.

From the report of Passed Asst. Surg. M. W. Glover the following is taken:

The medical inspection of aliens at the port of San Francisco is conducted by two medical officers of the service. The junior officer is stationed at Meigg's Wharf in the city proper, and boards incoming vessels with the quarantine officers. He examines alien cabin passengers and crews of foreign vessels, and, in addition, accompanies the quarantine officer examining the alien steerage, making note of any deformities or diseased conditions among them within the scope of the immigration law and which are concealed by clothing, such as hernias, tumors, venereal diseases, etc. The memoranda thus made are sent to the senior medical officer, along with the alien steerage and any detained cabin passengers, to Angel Island. Here are located the examining station of the Immigration Service, the immigrant hospital, and the detention sheds.

Alien steerage passengers are examined immediately on landing by the senior medical officer. On the day of landing certificates are issued only for those conditions or diseases about which there can be no doubt and which are of a permanent nature. All aliens presenting evidences of more serious diseases or conditions are placed in the hospital, and are disposed of as the development of the case warrants.

The new Immigration Station on Angel Island was opened on January 22, 1910.

The distinctive races represented among the aliens arriving at San Francisco (Chinese, Japanese, Hindus, Europeans, and Latin-Americans) necessitates separate quarters being provided for each race. The hospital building contains five wards designed to accommodate 50 persons, but only four wards have been opened so far.

From the 1st of February, when the hospital was properly opened, to June 30, 1910, there were admitted 283 patients. Of these 203 had inflamed eyelids, 93 of which were certified as having trachoma. According to race, there were 137 Hindus, 136 Chinese, 6 Japanese, 3 Europeans, and 1 American, the last being a workman, who was stabbed by a fellow workman. One death occurred in the case of a Hindu suffering from lobular pneumonia.

During the fiscal year 11,437 aliens were examined by the medical officers and 1,089 certificates were issued; for trachoma, 631; for tuberculosis, 1.

HONOLULU, HAWAII.

Passed Asst. Surg. Carl Ramus reports as follows: In former years the greater part of the immigration to Hawaii was Japanese. Since the agreement between the United States and Japan went into effect restricting the importation of Japanese and Korean laborers, Japanese immigration to Hawaii has nearly ceased. Efforts made by the plantation interests to secure European labor have not been very satisfactory, and hence they were forced to turn to the Philippines. During the past year the agents of the planters have caused Filipinos to migrate to Hawaii in gradually increasing numbers, and the Filipinos seem better fitted for work on the plantations than Europeans. Recently the agents of the planters have been given cable instructions to send Filipinos to Hawaii in numbers not exceeding 1,000 per month.

The substitution of Filipino for Japanese labor has had an important bearing on the quarantine work at Honolulu. The skins of Filipinos are much darker than those of the Japanese, and they have a much larger percentage of skin and venereal diseases. These facts render far more difficult the early diagnosis of smallpox and other eruptive fevers in Filipinos.

Under the present interpretation of the immigration law, Filipinos are exempt from its restrictions and do not receive the second examination at the immigration inspection where early eruptive cases would be detected.

DOMESTIC (INTERSTATE) QUARANTINE.

Plague-Suppressive Measures.

Plague-suppressive measures have been continued in California during the fiscal year on a somewhat different plan from that of previous years.

This change of plan was due to the fact that plague infection had been found in the common ground squirrel of California (*Citellus beecheyi*). Previously, the measures had been confined to certain cities and adjoining territory, and consisted, in the cities, of destruction and examination of rats, cleaning of premises, removal of garbage, etc., destruction of rat harbors, and rat-proofing of premises. In the country districts the work was confined to inspection of dead bodies, to determine whether death had been due to plague, and to occasional special investigations where conditions seemed to warrant them.

During the past fiscal year, however, much work has been done throughout the State for the purpose of determining to what extent plague has spread among the ground squirrels. As a result, infection has been found in 10 counties, a total of 354 infected squirrels having been found. In view of the small percentage of infection found in the counties more recently examined, hope is entertained that the work has been carried nearly to the edge of the infection. The total number of squirrels examined during the year amounts to 113,655, the percentage of infection being 0.312.

Since the beginning of squirrel-examination work in May, 1909, a total of 123,283 squirrels have been examined, the percentage of infection being 0.314.

Early in January, 1910, work was begun with the object of establishing a squirrel-free zone around the cities of Oakland and Berkeley, the object being to prevent the reintroduction of plague infection among the rats of these cities.

Only four cases of human plague were observed, and in all of these there was a history of association with squirrels, three of the cases being in squirrel hunters.

DISTRIBUTION OF INFECTED GROUND SQUIRRELS.

From observations made by the service and through the courtesy of the Biological Survey of the Department of Agriculture, the following information was obtained:

Plague has been known to exist in endemic form among the ground squirrels (*Citellus beecheyi*) of California since August 5, 1908, and has in all probability so existed for the five or six years preceding that date.

The ground squirrel is widespread throughout California, extending from Butte and Sierra counties, on the north, thence east of the Sacramento River and south of Suisun and San Pablo Bays and Carquinez Straits to San Bernardino County, in the south, covering all that territory from a point at 7,000 feet elevation in the Sierra Nevada Mountains to the Pacific Ocean, and on the east side of the Sierra Nevadas from an elevation of 8,000 feet it covers the slope as far north as Mono Lake. On the south the *Citellus beecheyi* merges with an allied type of squirrel, the *Citellus fisheri*, and on the east side of the Sierras with another allied type, the *Citellus grammurus.* From this point there extends an unbroken chain of rodents of the genus *Citellus* to central Michigan, and in the South to the Mississippi River. West of the Sacramento River and north of San Pablo and Suisun Bays and the Carquinez Straits, another type of ground squirrel of the same genus exists (*Citellus douglasi*). The prevailing flea on all these rodents is the Ceratophyllus, which flea will bite other rodents and man.

Plague has also been found in a wood rat (*Neotoma fuscipes*). Rats of this genus are found in numbers in all of those States west of a line drawn from the southwest corner of North Dakota to Pensacola, Fla., and are also found in the Appalachian chain of mountains from the Hudson River to northern Alabama.

From a study of the maps of California and the distribution of the railroads and the points at which plague-infected squirrels have been found, it would appear as though, possibly, the infection had been spread by the railroads. The explanation, which suggests itself, is that rats taken aboard trains in freight or by other means from infected points, as San Francisco and Oakland, while still in the incubation stage of the disease, were taken sick en route, and leaving the train as soon as possible went for refuge to the nearest hiding place, probably squirrel burrows (it is well known that rats will live peaceably in the same holes with squirrels and that the same flea may infest both animals), and in this way infected the squirrels of that particular locality. Other rats could then be infected by these squirrels, and so spread the disease in the same manner to other points.

There are 155,980 square miles of land in California. Infection has been found in an area comprising 20,273 square miles, the remaining territory infested by *Citellus beecheyi*, and which, for this reason, may be considered infectible, comprises an area of 67,797 square miles.

SAN FRANCISCO.

From July 1 to October 31, 1909, the city was divided into two sections or divisions. On November 1, 1909, the two divisions were consolidated.

During the past year neither human nor rat plague has been found in San Francisco.

The work is being carried along the same principles as in the previous years, due regard being paid to the changed sanitary conditions.

It consists almost wholly of measures for the destruction of rats, removal of their food supply, and the destruction of their harboring and breeding places by permanent rat proofing.

Destruction of rats.—At the present time in San Francisco 30 laborers are employed exclusively as trappers; they are divided into four squads, each squad housed in temporary quarters in a different section of the city and each under the charge of a foreman responsible for the work of his squad.

The entire city is divided into 60 sections; each trapper is allotted 2 sections, which he attends on alternate days. The number of traps allotted each man varies with the topography of his sections, but averages about 250 per man, there being over 7,600 traps placed and in use over the city.

By the use of alternate sections it is possible to double the trapping capacity of the force, and by allotting a definite section to a trapper he and he alone is responsible for the condition of the traps in that section, it being the duty of the foreman to inspect the condition of the traps of each trapper in turn.

Destruction of rats by the distribution of poisons is limited to the sewers, it not being deemed safe, in view of the absence of plague infection, to distribute poisoned bread about premises.

Permanent rat-proofing.—A record of the location where each rat is trapped is kept in a record book; this is made out by each foreman as the men return with their day's catch. These records are of use as evidence in proceedings of condemnation of premises.

As it is difficult by any system of book or card record to obtain a general knowledge of rat-infested localities, in other words, of the general distribution of the rat population over the city, the rat catch is shown graphically on a map made and kept especially for that purpose in the headquarters. Each rat caught is represented in its proper location by a colored pin.

The keeping of this map does not require much time and the information obtained from it is more than worth the trouble. It has been found that the presence of such a map is influential in inducing property owners, who come into the headquarters in answer to requests made of them to rat-proof their premises, to do the work.

Inspection of the map shows that the rats are not by any means evenly distributed over the city. It has been possible to localize three principal centers or localities much more infested than others, one of these being the wholesale fruit section, another the Japanese section, and a third the Butchertown section. Elsewhere in the city rats are caught, principally about places where foodstuffs are easily available, but they are scattered here and there over the blocks.

The discovery of these particularly infested localities makes it possible to concentrate the rat-proofing work to such localities. While it may not be possible to rid a city constructed of wood of its rat population, it may be possible to keep the rats mostly in the sewers and so scattered and so few in number that a rapid dissemination of plague infection would be improbable. This result would make it possible to destroy fresh plague infection within the limits of a block or a few blocks.

On the 1st of May, 1910, the city authorities appointed a number of inspectors to serve under the direction of officers of the United States Public Health and Marine-Hospital Service. With these inspectors a systematic reinspection of premises was made, this reinspection showing that general cleanliness and care in the disposal of garbage was being well observed.

A general reinspection of stables is now being made by these inspectors, with the view principally of compelling stable owners to make a proper disposal of the manure and thus do away with the principal hatching and breeding places of flies.

Summary of operations.

	Number.
Sick inspected	36
Dead inspected	30
Rats infected with *B. pestis*	0

Plague, none.

1. MEASURES TAKEN FOR THE DESTRUCTION OF RATS.

	Number.
Rats trapped	68, 778
Rats found dead	932
Mice trapped	15, 630
Poisons placed	313, 913
Squirrels trapped	24
Gophers trapped	194

The number of mice trapped is an unavoidable incident in the trapping of rats.

RESULT OF TRAPPING OPERATIONS FROM JANUARY 1, 1910, TO JULY 1, 1910.

	Average daily number of traps set.	Number of rats per 100 traps per day.
Butchertown	334	7.5
Sewers	613	6.3
Vacant lots	169	4.5
Steamers	159	3.7
Water front	320	3.6
Restaurants	913	3.5
Stables	764	3.4
Factories	437	3.2
Stores	2,176	3.0
Bakeries	64	2.3
Warehouses	283	1.7
Dwellings	1,555	1.6

General average of catch for entire city 3.7 per 100 traps per day.

2. MEASURES TAKEN FOR THE DESTRUCTION OF RAT FOOD.

	Number.
Premises inspected	66, 912
Complaints inspected	852
Garbage cans installed	1, 718
Chicken yards abandoned	57
Chicken yards concreted (23), area in square feet	2, 400
Chickens disposed of	1, 049
Premises screened	892
Toilets screened	214
Health signs posted	368
Notices served	1, 522
Plumbing complaints referred to board of health	185

3. MEASURES TAKEN FOR THE DESTRUCTION OF RAT REFUGE.

	Number.
Yards torn up	92
Basements torn up, by owners	62
Passageways torn up, by owners	116
Floors torn up, by owners	155
Sidewalks torn up, by owners	81
Houses destroyed, by owners	359
Premises in which wood was piled off ground	330

WORK DONE THROUGH CONDEMNATION BY THE BOARD OF HEALTH.

	Number.
Premises condemned by board of health during year	259
Premises heard for first time, but not condemned	414
Rehearings of condemnations	314
Premises condemned and abated	209
Premises condemned and unabated	168

CONCRETE WORK DONE (OLD PREMISES), DWELLINGS AND STORES.

	Number concreted.	Area in square feet.
Basements	84	351,870
Floors	149	239,770
Yards	63	22,859
Passageways	55	23,252
Sidewalks	82	81,898
Total		719,649

	Number.
Buildings made rat-proof:	
(*a*) By concreting	362
(*b*) By galvanized iron	18
Stables concreted (area in square feet, 81,825)	57
Stables abandoned	60
Stables under construction	57
Stables that have done nothing	11

CONCRETE WORK DONE (NEW PREMISES), DWELLINGS AND STORES.

	Number concreted.	Area in square feet.
Basements	530	1,254,125
Floors	39	160,251
Yards	30	35,060
Passageways	99	20,445
Sidewalks	206	185,222
Total		1,655,103

4. CLEANING AND DISINFECTION.

	Number cleaned.	Number disinfected.
Vacant lots	546	53
Streets	10	10
Buildings	116	116
Basements	478	133
Passageways	143	143
Yards	854	168
Toilets		129
Plumbing nuisances abated		116
Loads of débris removed		120,000
Premises cleaned of rubbish		853
Lots from which stagnant water has been pumped		56

OAKLAND.

Human plague.—One case of human plague developed in Oakland in October, 1909. This case was that of a young man who had been squirrel hunting in Contra Costa County a few days prior to the onset of symptoms. An examination of the laboratory records showed that infected squirrels had been found some time previously on the ranch where he had been hunting. The symptoms were quite typical and the clinical diagnosis was confirmed by bacteriological methods. The patient recovered. A second case of plague was brought to a hospital in Oakland for medical treatment and a diagnosis made when the bubo was removed at operation. This case was one of great interest as it was of the subacute type which is rather rare. The patient died after an illness of about two weeks.

Rodent examinations.—The trapping of rats in Oakland has been carried on throughout the year. The total number trapped and examined is shown in the following tabulation: *Mus norvegicus*, 29,257; *Mus musculus*, 3,471; *Mus rattus*, 94; *Mus alexandrinus*, 104. Total, 32,926.

No case of rat plague was found during the year.

The inspectors of the service report upon insanitary premises in the city. These reports are transmitted to the health officer, who takes such steps as he deems proper. There is no systematic destruction of rat harbors and no movement for the improvement of sanitary conditions such as is in progress in San Francisco.

Relations with local authorities.—It will be remembered that the Oakland City Council has never given the cordial support to the work of the service that has been given in San Francisco. Indeed, their support was entirely withdrawn during a period in 1908. The antagonism to our work became so pronounced in 1909, that a resolution was passed cutting off support from the city. The matter was taken up with his honor the mayor who has always favored the antirat campaign. He advised the officer in charge to continue the work, as it was believed that the council would change its attitude and appropriate the small sum necessary.

At the end of the fiscal year, the matter is still pending, and no action has been taken by the council. This is most unsatisfactory, but earnest efforts to have the situation remedied have been unavailing.

BERKELEY.

No antiplague work has been done in Berkeley since early in 1908, but the discovery of an extensive focus of plague among the ground squirrels near the city made rat examinations very necessary, as it seems likely that there is a great risk of the infection of these rodents from the squirrels. The work was begun in February, 1910, and up to and including June 30, 1910, rodents have been trapped and examined as follows: *Mus norvegicus*, 789; *Mus musculus*, 128; gophers, 1. Total, 918.

FIELD WORK.

Since 1903, the presence of bubonic plague among the ground squirrels was suspected, but although every effort was made to establish the fact the disease was not proven to be present until the summer of 1908, when four naturally infected squirrels were found. Subsequent investigation during the fall of 1908, and spring of 1909, indicated the presence of a rather widespread epizootic, and the necessity for its control became apparent. In April, 1909, a well-organized campaign was inaugurated for the purpose of determining the extent of this infection and to evolve, if possible, a plan for the complete eradication of the squirrel.

Passed Asst. Surg. W. C. Rucker, who had conducted part of the investigations of the previous summer, was assigned the immediate charge of the work, and for the year following, until the end of April, 1910, continued actively engaged in the direction of the field operations. In October, 1909, Asst. Surg. Friench Simpson was detailed to assist in the work, and in May, 1910, succeeded in charge.

Equipment.—The active work of the campaign began with the assignment of a number of men to various points in Contra Costa County. These men were designated "squirrel hunters," for, after considerable preliminary experimentation, it was found that specimens for laboratory examination could be most readily obtained by shooting the squirrels, and shotguns were found best adapted to this purpose. A 12-gauge gun, using ammunition loaded with smokeless powder, with a charge carrying 1⅛ ounces of No. 6, No. 7, or No. 8 shot, depending upon the individual preference of the hunter, was provided. In addition, each hunter was supplied gun oil, a cleaning rod, knapsack, canteen, squirrel tags, twine, chloroform, report blanks, and stationery. A definite number of milk cans were assigned to each as containers for squirrel shipments. In rare cases a small tent and cot were added when shooting was done in districts providing no accommodations; this completed the equipment of each man.

Duties of hunters.—On reporting for work the hunter was very carefully instructed in his duties; more especially, he was directed to tag individually each squirrel when shot, the tag showing the date, name of the ranch, the direction and the distance from the nearest city or town, adding, when possible, the section, township, and range. At the end of the day's shooting the squirrels were placed in the cans, a definite quantity of chloroform added for flea destruction, and the tops tightly closed. The cans were then forwarded by express to the laboratory, and a report of the day's operations made to headquarters. The hunter was warned of the dangers of the work, offered the opportunity to receive Haffkine's prophylactic, and directed never to introduce the hand and arm into a squirrel hole because of the danger from infected fleas, the bite of a rattlesnake or a wounded squirrel.

Extent of infection.—During the early part of the campaign the work was confined to the counties of Alameda and Contra Costa, contiguous to San Francisco Bay, but at the end of September, 1909, the disease had been found so widespread that the skirmish line was extended farther south, scouting parties being sent in October into the counties of Santa Clara, San Benito, San Joaquin, Merced, and Stanislaus. On October 16, infection was found in San Benito County, and on the 30th three infected squirrels were found in Santa Clara County. During the same month a party was sent north into Solano County, but few squirrels were found, and at the end of October the hunters were withdrawn. Shipments of squirrels from other northern counties, viz, Napa and Colusa, have been received, but nothing suspicious recorded.

In Contra Costa County the disease was found so prevalent among the squirrels that an attempt was made in the latter part of October to institute a general eradicative campaign. It was thought that the most successful end could be reached by supplying individual landowners with free poison. Accordingly, orders for poisoned wheat and bisulphide of carbon were taken, and during the months of October, November, and December 32,770 pounds of wheat and 885 gallons of bisulphide were distributed among 840 farmers for application over squirrel-infected territory, the recipient in each instance signing an agreement providing for the thorough and economical use of the poison. A careful record of these shipments was made, and from the majority most gratifying reports of squirrel destruction were received.

In November the skirmish line was again extended south to include the counties of Santa Cruz, Ventura, Tulare, Santa Barbara, San Luis Obispo, Monterey, Fresno, and Kern, hunters being withdrawn from Alameda, Santa Clara, San Benito, and Stanislaus for this purpose. On November 20, an infected squirrel was found in the southern part of Santa Cruz County. Early in December hunters were sent into San Mateo and Mariposa Counties, but at the end of December no further extension of the zone of infection had been made. Fifty-one thousand three hundred and twenty-three squirrels had been examined, 305 of which were found infected, the infected animals being secured from the following counties: Contra Costa, 240; Alameda, 54; Santa Clara, 9; San Benito, 1; Santa Cruz, 1. Total, five counties, 305 infected squirrels.

A squirrel-free zone.—In January, realizing the potential danger residing in foci of squirrel infection scattered immediately beyond the bay cities of Berkeley, Oakland, and Alameda, the throwing of a squirrel-free zone around these cities was decided upon. A squad of men, in charge of an inspector, and under the immediate supervision of a foreman, began squirrel eradicative work on January 7. A point on the bay, north of the city of Berkeley, on the county line, was selected, and following this line from the point of origin to a point just north of the town of Diamond or North Fruitvale, and southeast of Piedmont Heights, a suburban portion of East Oakland, a belt averaging 1 mile in width, has been made practically squirrel free by the thorough use of bisulphide of carbon and poisoned wheat. This work has continued without interruption, and a vast territory has been covered. Shortly after this work was undertaken two foci of infection were found within the limits of this zone, and during January, February, March, and April a total of 22 infected squirrels were found, the disease being present in both acute and chronic forms. When it is remembered that the area confining this work just skirts the inhabited portions of these cities, its importance can be readily appreciated.

In the spring of the present year, no infection having been found in the outlying counties of Ventura, Fresno, Mariposa, and Santa Barbara, the hunters were withdrawn, the skirmish line narrowed, and the work concentrated. Hunting was begun again in Stanislaus, Santa Clara, and San Benito Counties, and additional men sent to Monterey, Santa Cruz, San Joaquin, and Merced Counties. In localities previously found infected in the fall of 1909, this return proved very significant. A few days' shooting over infected ranches again disclosed the presence of the disease.

The work previously done in the counties of San Joaquin, Stanislaus, and Merced had been confined principally to the foothills and that portion of the valley east of the Southern Pacific Railroad. The hunters were now directed to confine operations to the foothills and the territory lying west of the railroad. As a result, five infected squirrels were found in San Joaquin, five in Stanislaus, and two in Merced, all in the western portions of these counties.

During the latter part of May infection was first found in Monterey County, a total of four to date, but only after the careful laboratory examination of over 12,000 squirrels.

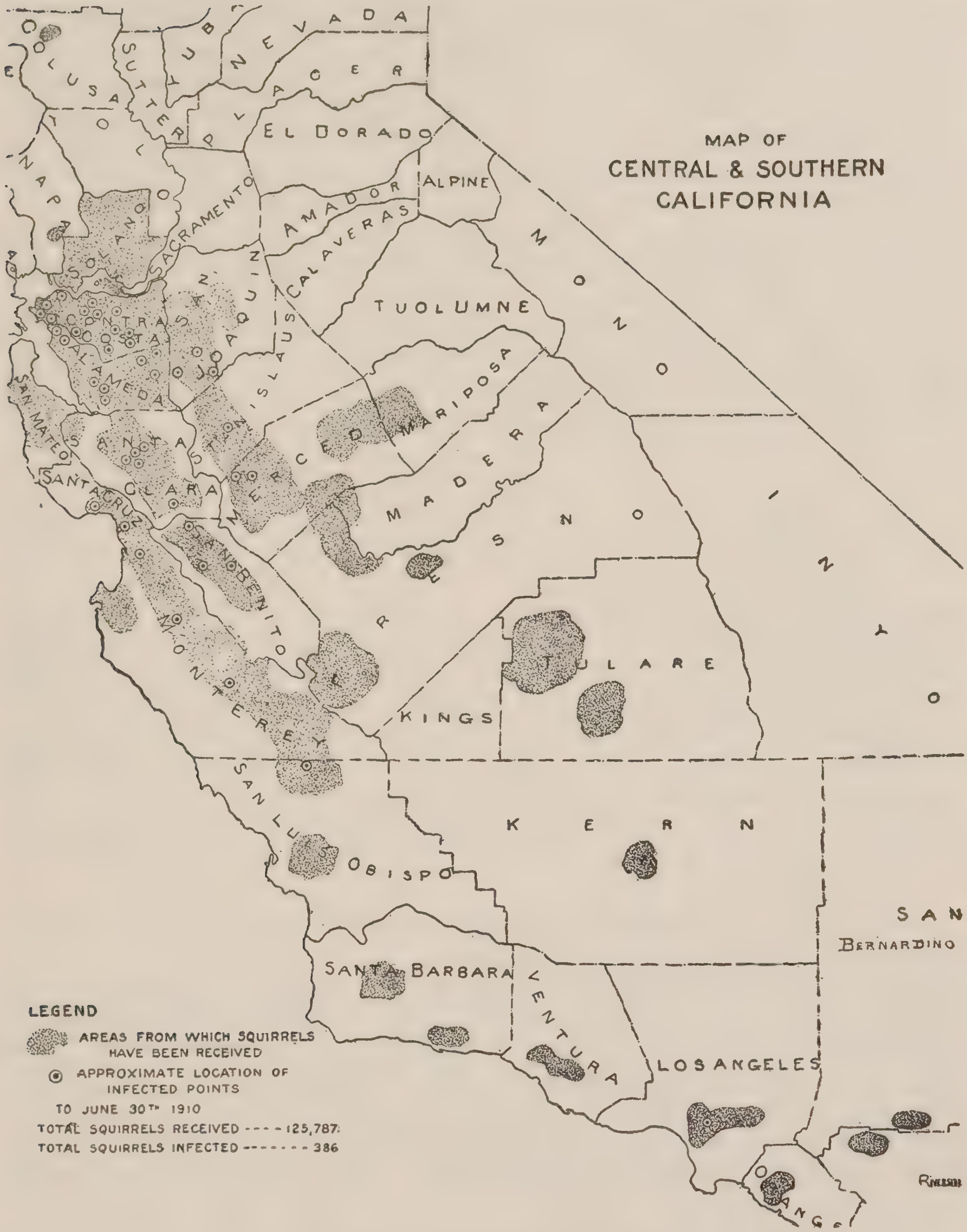
On June 1, the work of squirrel examination was extended to include a portion of southern California, and hunters are now shooting within the city and county of Los Angeles and the adjacent counties of Orange, San Bernardino, and Riverside.

Branch laboratory.—In order to anticipate the onset of putrefactive changes, which advance rapidly in shipments of squirrels over great distances, a branch laboratory was established at Los Angeles for post-mortem work. An expert, trained in the laboratory at San Francisco, was placed in charge, and all tissue of a suspicious nature will be immediately forwarded to the San Francisco laboratory for examination.

The appended statement indicates the work done for the fiscal year ending June 30, 1910. While the percentage of cases of infection found represents roughly the comparative degree of infection in the various counties, it is not to be regarded as representing the total amount of infection present, since the work was undertaken primarily to determine the limit of the zone of infection, and frequently hunting operations have been pushed into new territory upon the finding of a positive focus.

SUMMARY OF FIELD OPERATIONS, FISCAL YEAR ENDING JUNE 30, 1910.

Counties.	Ranches inspected.	Squirrels trapped.	Squirrels found dead.	Squirrels shot.	Squirrels examined bacteriologically.	Infected bacillus pestis.
Contra Costa	2,389	46	112	25,553	23,800	212
Alameda	1,027	4	362	7,659	7,457	81
San Mateo	203	1		2,903	2,819	
Santa Cruz	326	26	4	1,480	1,402	3
Santa Clara	395	14	8	6,958	6,813	22
San Benito	226		15	3,950	3,894	19
Monterey	974	35	52	14,815	14,635	4
San Luis Obispo	693	20	62	7,688	7,589	1
San Joaquin	522	102	9	4,411	4,239	5
Stanislaus	68		3	2,009	1,976	5
Merced	633	36	19	9,250	8,951	2
Mariposa	68	7	1	697	687	
Madera	19			765	755	
Fresno	528	27	75	11,571	11,515	
Tulare	900	30	13	6,399	6,367	
Kern	46			339	326	
Santa Barbara	500	25	10	4,732	4,651	
Ventura	147	12	5	2,237	2,189	
Los Angeles	75		60	1,857	1,809	
Orange	40		4	572	526	
San Bernardino	18		14	336	321	
Riverside	39		275	335	597	
Solano	26			230	216	
Napa	2			11	11	
Colusa	22			110	110	
Total fiscal year	9,886	385	1,103	116,867	113,655	354
Previously reported	1,085	457	248	4,223	8,920	32
Grand total	10,971	842	1,351	121,090	122,575	386



LABORATORY INVESTIGATIONS.

In August, 1909, Passed Asst. Surg. G. W. McCoy was directed to take charge of the laboratory work in Oakland, in addition to that in San Francisco. Prior to this time the work in Oakland had been under the supervision of Acting Asst. Surg. William B. Wherry.

In June, 1910, it became necessary to establish a small branch laboratory in Los Angeles. The work was placed under the direction of a thoroughly trained assistant from the San Francisco laboratory. The work of the Oakland and Los Angeles laboratories are included in this report.

Routine work.—During the year a number of trips have been made to various points in the State for the purpose of seeing cases that were regarded as suspicious of plague. In this manner four cases of plague have come under observation, two in Alameda County, one in Contra Costa County, and one in San Benito County. All of these cases were infected in localities where plague-infected ground squirrels had been found previously or were found after the development of the human cases. Two of the cases recovered and two died.

Rodent examinations.—The examination of rats trapped, at San Francisco, has been carried on throughout the year, but no plague infection has been found.

Rodents, principally ground squirrels from various counties, have been examined and a large number of infected ground squirrels have been observed. One wood rat was shown to be infected. A table of the rodent examinations is presented below.

Rats:	
Mus norvegicus	123, 955
Mus alexandrinus	2, 690
Mus rattus	7, 783
Mus musculus	3, 599
Plague infected, none.	
Other animals:	
Ground squirrels	113, 655
Plague infected	354
Wood rats	60
Plague infected	1
Gophers	610
Rabbits	889
Weasels	31
Coyotes	2
Moles	37
Field mouse	1
Plague infected, none.	

By combining the totals of rats and other animals we find that the grand total of animals was 253,312.

The work has grown so large that it is no longer possible for the medical officer to personally examine every rodent dissected, and indeed that is no longer necessary. Several of the laboratory assistants have become very expert in the recognition of the various pathological lesions found in these rodents. When an animal is found that is regarded as suspicious of plague it is at once submitted to the medical officer, who carries out such a detailed examination as may be necessary.

Research work.—The heavy demands made on the time of the laboratory staff by the routine work have left but little opportunity to carry out purely experimental investigations. The space available for keeping inoculated animals was rather limited until the Oakland laboratory was opened.

Flea transmission.—During the year several experiments on flea transmission of plague have been carried out. These have been made the subjects of separate reports. They may be summarized by the statement that the evidence appears to indicate that the squirrel fleas of California are equally efficient as plague carriers as are the rat fleas of India. An extensive series of experiments on various aspects of the bionomics of fleas was conducted by a member of the laboratory staff, and the results of these experiments have been published in Public Health Bulletin No. 38.

The finding of a plague-infected wood rat (*Neotoma fuscipes*) necessitated extensive experimentation in order that the fact might be established beyond any doubt.

Susceptibility of other rodents.—A series of experiments was carried out for the purpose of determining the susceptibility to plague of certain rodents from the Fort Stanton Reservation in New Mexico. It was shown that, so far as one can judge from the few experiments that it was practicable to perform, the prairie dog (*Cynomys ludoviciana arizonensis*, Mearns), the eastern desert wood rat (*Neotoma albigula angusticeps*, Merriam), and the rock squirrel (*Citellus grammurus*, Say), are quite susceptible to plague. The primary object of the experiments was to determine whether there existed across the continent a chain of susceptible animals that under certain conditions might carry the infection from the ground squirrels of California to the other States.

LABORATORY FACILITIES AFFORDED OTHERS.

The facilities of the laboratory have been available to the other branches of the service located at San Francisco. Large numbers of rats have been examined from steamers that have been fumigated at the quarantine station. Tissues and secretions have been examined at the request of the officers in charge of the medical examination of aliens. A sample of meat from the marine hospital was submitted for examination and found to be infected with an organism the nature of which has not yet been determined, but which gives rise to very remarkable and characteristic lesions in the guinea pig.

LABORATORY DEMONSTRATIONS.

Every opportunity has been utilized to make the laboratory useful for educational purposes. Demonstrations have been arranged for classes in hygiene of the Stanford University, the Hahnemann Medical College of San Francisco, and the Oakland Medical College of Oakland. As in previous years, large numbers of physicians have visited the laboratory for the purpose of familiarizing themselves with the work in progress. These demonstrations and visits have constituted a severe tax on the time and energy of the laboratory staff, but it is believed that in supplying information on the subjects under investigation considerable benefit has been derived.

PATHOLOGICAL SPECIMENS FURNISHED.

Arrangements have been made for supplying the medical colleges of the United States with slides showing the plague bacillus and tissues from plague-infected rodents. In response to the invitation to make requests for the tissues, 104 applications for specimens were received, all of which have been complied with.

A number of museums have asked for skins of ground squirrels and other rodents. These have in all cases been furnished.

A number of scientific investigators have asked for rats inoculated with rat leprosy, in order that they might carry on studies of this most interesting disease. In compliance with these requests, inoculated animals have been sent to Tokyo, Japan; Honolulu, Hawaii; and to various centers of scientific research in the United States.

GENERAL PLAN OF OPERATIONS CONTEMPLATED.

In view of all that has preceded it would appear that, while the danger of plague spreading to other portions of the United States may be more or less remote, it is nevertheless real.

During the coming year it is planned to extend the work for the purpose of outlining the infection as quickly as possible.

The division of the operations contemplated will be under the three heads following:

1. Destruction of known foci of infection.
2. Determination of new and, at present, unknown foci of infection, to the end that the extent to which the infection has spread, be made known as soon as possible.
3. General squirrel eradication.

The first two subdivisions are to be handled by the service, the last to be handled by the service and the State of California combined, but under the direction of the service.

The general plan of operations thought best is as follows:

The State to be divided into three subdivisions, a northern district, a central district, and a southern district, all under the direction of Surg. Blue.

For the present, the chief efforts will be directed toward the discovery of new foci of infection, for the purpose of determining and outlining the limit to which the infection has already spread, the present work now under way being continued, viz, the creating of squirrel-free zones around the cities of San Francisco, Oakland, Alameda, Berkeley, and vicinity, and such work as may be necessary to show whether or not plague has reappeared, or is likely to appear, among the rats of the above-mentioned cities.

The work outside of the cities will be organized on the basis of five men to each county, these men to work out from railroad freight yards as centers, and to pay particular attention to such points on the State line as the railroads cross, for the purpose of learning whether or not infection may have extended into adjoining States.

As soon as infections have been demonstrated in several different places within a particular county, the entire county will be considered as infected, and the force moved to another county, and so on, until the area of infection has been definitely limited and defined.

Scouting parties will be sent into Arizona and Nevada and into the territory north of San Francisco Bay and west of the Sacramento River, and directed to begin operations around freight yards, freight transfer points, and other strategical points, for the purpose of learning whether infection has been carried into those sections.

As soon as the area of infection has been definitely defined the State of California will be asked to appoint as large a number of inspectors as may be needed, to act in conjunction with and under the direction of the service for the purpose of eradicating all squirrels and other infectible rodents within the limits of the infected area, and for a reasonable distance outside. The State inspectors to be used, more particularly, to direct the efforts of farmers, ranchers, and landowners generally, to the end that an organized systematic and coordinated campaign of rodent extermination be carried out.

ANTIPLAGUE OPERATIONS IN SEATTLE, WASH.

The operations of the service in connection with the eradication of plague in Seattle were fully described in the last annual report. The work has continued as before, the municipal department of health and sanitation maintaining the work of trapping and poisoning the rats, and the service furnishing the laboratory equipment and the bacteriologist for the examination of rodent and human suspects for plague infection.

The laboratory work was discontinued between August 25 and December 15, 1909, pending the construction of a new building, the one formerly in use having been of necessity abandoned on account of the work of regrading the city. On account of the destruction of the new laboratory building by fire, the work was interrupted between March 1 and March 30, 1910.

No human plague suspects have been reported in Seattle during the year, and only one plague-infected rat has been found during this period. This rat was found on February 8, 1910, the date on which the last preceding infected rat was found being September 26, 1908.

During the year 56,184 rats were delivered to the laboratory, of which number 25,425 were necropsied.

SANITARY REPORTS AND STATISTICS.

Collection and Publication of Statistics.

The bureau receives weekly reports from local health authorities throughout the United States on forms furnished for that purpose, giving the number of cases and deaths from certain diseases for each week. Monthly reports are received from State health officers of the number of cases of smallpox and also of poliomyelitis. Service officers engaged in a suppression and investigation of epidemics in the United States submit special reports. Weekly reports are received from American consular officers and officers of the service in foreign countries, giving the number of cases and deaths from certain diseases and the sanitary conditions existing.

Countries signatory to the sanitary convention of Paris forward information of the presence and prevalence of cholera and plague. Those signatory to the convention of Washington furnish information of yellow fever in addition to cholera and plague.

In addition to these reports, copies of the annual reports, bulletins, or pamphlets, published by State and local health authorities and foreign sanitary officers, are received. The bureau has aimed to establish a complete file of the yearly printed reports of all State boards of health.

The information gained from these sources is published weekly in the weekly Public Health Reports and distributed to State and municipal health authorities, officers of the service, American consuls, and others interested.

Special articles of a public health or sanitary nature have appeared from time to time in the Public Health Reports, and a list appears on pages 208, 209.

Smallpox in the United States.

Smallpox has a world-wide distribution. In some countries it is a common disease. In others, where general vaccination is practiced, it is comparatively rare. The reports of cases and deaths received from outside the United States give usually a case mortality rate of from 25 to 50 per cent.

During the year smallpox has been generally prevalent throughout the United States. Forty-one States and the District of Columbia reported 25,084 cases, with 216 deaths. This is 427 cases and 141 deaths more than were reported last year. The number of cases for the past two years is practically the same, whereas the number of deaths reported in 1910 is three times as great as that reported in

1909. These figures do not show the actual amount of smallpox which has existed, for many of the States have no adequate provision for the reporting of cases of disease.

CASE MORTALITY.

The mortality rate has varied markedly. On the whole, it has been low. Kansas reported 2,058 cases, with only 3 deaths, while Oklahoma reported 1,082 cases, with 55 deaths, the former being a case mortality rate of 0.145 per cent, and the latter of 5.083 per cent. There were several local outbreaks in which the disease showed a virulence similar to that met with in most foreign countries, a virulence which has usually been considered a characteristic of the disease.

VIRULENT OUTBREAKS.

In Norfolk, Va., during April, May, and June, 1909, there were reported 66 cases of smallpox, with 17 deaths.

Dr. C. T. Moffett, health officer of Bee County, Tex., reported an outbreak at Normanna during January, 1910, in which there were 12 cases, with 5 deaths.

At Bay City, Mich., during March, April, and May, 1910, there were 94 cases, with 27 deaths.

At Cleveland, Ohio, during May and June, 1910, there were reported 59 cases, with 10 deaths.

In Oklahoma County, Okla., during March, 1910, there were 17 cases reported, with 14 deaths.

In Denton County, Tex., from December 26, 1909, to February 27, 1910, there were reported 106 cases, with 15 deaths.

At Fort Worth, from November 1, 1909, to May 31, 1910, 90 cases, with 8 deaths were reported.

At Bellingham, Wash., during February and March, 1910, there were reported 5 cases, with 2 deaths.

The location of these virulent outbreaks shows a wide distribution, including as it does Michigan, Ohio, Virginia, Oklahoma, Texas, and Washington.

Geographical Distribution of Smallpox, July 1, 1909, to June 30, 1910.

During the fiscal year 1910 smallpox has been reported as follows: In Asia, in Arabia, Ceylon, China, India, Indo-China, Japan, Korea, Manchuria, Persia, Siam, Siberia, Straits Settlements, and Turkey; in Europe, in Austria, Belgium, France, Germany, Gibraltar, Great Britain, Greece, Hungary, Italy, Malta, Netherlands, Norway, Portugal, Russia, Spain, Switzerland, and Turkey; in Africa, in Abyssinia, Algeria, Egypt, Siberia, and Tripoli; in South America, in Argentina, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay, and Venezuela; in North America, in Canada, Mexico, and the United States; in the West Indies, in Porto Rico; in the East Indies, in Java; in the Philippines; and on the island of Mauritius.

The foreign cities in which smallpox was most prevalent were as follows:

Place.	Date.	Cases.	Deaths.
Argentina, Buenos Aires	Mar. 1, 1909, to Feb. 28, 1910		242
Brazil:			
Bahia	May 22, 1909, to Apr. 29, 1910	787	537
Pernambuco	Apr. 1, 1909, to Mar. 15, 1910		618
Rio de Janeiro	May 17, 1909, to Feb. 27, 1910	116	32
India:			
Bombay	May 26, 1909, to May 17, 1910		1,007
Calcutta	May 16, 1909, to May 30, 1910		164
Rangoon	May 12, 1909, to May 7, 1910		347
Italy, Naples	May 31, 1909, to May 29, 1910	556	131
Mexico:			
Aguascalientes	June 21, 1909, to June 4, 1910		105
Mexico City	May 16, 1909, to May 14, 1910		131
Monterey	June 14, 1909, to Apr. 10, 1910		37
Veracruz	June 1, 1909, to Feb. 19, 1910	30	9
Portugal, Lisbon	May 30, 1909, to May 28, 1910	802	
Russia:			
Moscow	May 16, 1909, to May 21, 1910	791	284
Odessa	May 30, 1909, to May 21, 1910	842	217
St. Petersburg	May 16, 1909, to May 7, 1910	1,513	425
Warsaw	Apr. 25, 1909, to Mar. 5, 1910		359
Spain, Barcelona	June 1, 1909, to May 30, 1910		139
	May 1, 1909, to Apr. 30, 1910		730

BERIBERI IN THE UNITED STATES.

Cases of beriberi have seldom been reported in the United States, and for this reason the occurrence of an outbreak in South Carolina is of interest. This outbreak occurred among the colored convicts in a camp at Ten Mile Hill, about 10 miles from Charleston. There were at least 17 cases of beriberi, with 8 deaths.

In California, during the years 1907, 1908, and 1909, 25 deaths from beriberi were reported. Of these 22 were of Japanese, 2 of Chinese, and 1 of German nativity.

A series of 71 cases was reported among the patients in the State insane hospital at Tuscaloosa, Ala., during the years 1895 and 1896. Of these 21 were fatal.

In 1907 over 200 cases developed in the Texas State Lunatic Asylum at Austin. Of these 20 were fatal.

BERIBERI IN THE PHILIPPINES.

Dr. Heiser has reported that in view of the recent results recorded by Fraser and Stanton, of the Straits Settlements; Aron, of the Philippine Medical School; and others before the meeting of the Far Eastern Association of Tropical Medicine, recently held in Manila, that beriberi in the Orient is due to the continuous consumption of polished rice as a staple article of diet, that the direct cause of this is probably due to the lack of phosphorus, which is removed in the polishing, and that beriberi is probably a phosphorus starvation. The beriberi patients in the hospitals of the bureau of health have been treated by administering rice polishings, with the result that the cases promptly commenced to improve and soon recovered. Unpolished rice has been used in public institutions in which beriberi was rife, with the result that the disease has completely disappeared.

Cholera in Russia.

Cholera has for several years appeared annually in epidemic form in various districts of Russia. The city and government of St. Petersburg and the southern governments have suffered most.

During the summer of 1909 the disease was present over a widespread area. In St. Petersburg there were more than 6,000 cases and over 2,000 deaths. The disease prevailed in all parts of the city and cholera bacilli were found in the water of the Neva River, from which the city obtains its supply. The disease gradually subsided with the approach of winter, and the last case in St. Petersburg was reported January 1, 1910, and the last case in all Russia January 29, 1910.

The disease appeared again in May of this year (1910), 15 cases with 3 deaths being reported in Bachmut district and 2 cases with 1 death in the city of Ekaterinislav, both in the government of Ekaterinislav, during the week ended May 12, 1910. The disease reappeared in St. Petersburg about the middle of June, 4 cases being reported between June 19 and 25. On June 18 the disease was present throughout southern Russia and over 6,000 cases had been officially reported. By August 6 the number had increased to 81,083 cases, with 35,759 deaths.

Cholera in Germany.

On July 21, 1909, an American traveling in Europe died of cholera at Konigsberg, Germany. In September a fatal case of cholera occurred in Pakalisne, near Russ, in eastern Prussia. The patient was a boatman and his wife also contracted the disease. On September 22, another fatal case occurred at the town of Stolzenhagen, 25 miles north of Stettin. In October, November, and December cases were reported at various places in east Prussia. On December 30, 1909, Germany was declared free from cholera, there having been since July 21 a total of 44 cases. June 23, 1910, a Russian emigrant from Warsaw district died of cholera at the immigrant inspection station at Ruhleben, near Berlin. June 27, the wife of the preceding case also died of cholera. August 29, 2 cases were reported in Germans residing at Spandau, near Berlin. September 14, 10 cases were reported at Kalthoff, a suburb of Marienburg.

Cholera in Sweden.

At Stockholm, Sweden, a case of cholera developed on August 12, 1909, in a person who had arrived by steamship from St. Petersburg on August 10. No further cases developed.

Cholera in the Netherlands.

Two cases of cholera were reported at Rotterdam on August 20, 1909. Vigorous measures were immediately inaugurated to prevent the spread of the disease. During the week ended September 4, 20 cases with 8 deaths were reported, making a total up to that time of 34 cases, with 14 deaths. Another death occurred September 8, making a total of 15 deaths. September 14 Rotterdam was declared to be free from cholera, the last case having been reported September 4 and the last death September 8.

During the week ended September 4, 1909, single cases of cholera were reported at the following places: Uithorn, Bieda, Gorinchem, Utrecht, Tholen, Middelburg, and Vlaardinger. The cases were all among bargemen directly from Rotterdam. September 10, single cases were reported at Amsterdam and Dirksland. September 24, cases appeared at Hansweert and at Lopik. During the first week in October 4 cases with 1 death were reported at Hattem. During the last 10 days of October, 2 cases with 1 death were reported at Jaarsfeld. Isolated cases had been also reported at Dordrecht, Garkum, Hoogvliet, and Pernis.

Cholera infection had been rather widely disseminated in Holland and had it not been for the prompt and efficient measures taken at all places where cases appeared. a more serious outbreak would undoubtedly have occurred.

At Rotterdam there had been about 200 persons, including nurses and physicians, who had come into contact with the cholera patients. The stools of these contacts were examined and nine were found to be cholera bacillus carriers. Two of the carriers became slightly ill, while seven remained in good health, with a tendency to diarrhea. These carriers harbored the cholera vibrio for periods varying from 5 to 12 days after coming under observation. The finding of the carriers is suggestive of the manner in which the disease may frequently be spread.

Cholera in Belgium.

Nine cases of cholera with 6 deaths were reported between October 26 and 30, 1909, at Boom, a town with a population of about 17,000 inhabitants, situated 10 miles from Antwerp.

Cholera in the Philippines.

Cholera was present in the Philippines throughout the year. In Manila from July 11, 1909, to March 26, 1910, there were 310 cases reported, with 241 deaths, in April there was 1 case, and from May 22 to June 4 there were 4 cases.

On March 28, 1910, Passed Asst. Surg. Heiser, director of health for the Philippines, reported that the Philippines were probably more free from cholera than they had been for a number of years, and that during the preceding week only 12 cases had been reported in the islands. A determined effort was being made to isolate every case and determine whether the disease could be stamped out completely, also whether it was endemic in the islands or must be reintroduced from other countries to start a new outbreak.

One of the difficulties to be met in eradicating cholera in Manila was brought to light when it was found that many of the deaths reported as due to meningitis were in reality cases of cholera. Out of 29 deaths reported in the death certificates as due to meningitis, 12 proved to be cholera, 8 beriberi, and only 9 meningitis.

Cholera in Italy.

On August 17, 1910, cholera was reported in Italy. The cause of the outbreak is alleged to have been the embarkation at Brindisi of a party of Russian gypsies from Batum. They proceeded by rail to Trani, which appeared to be the primary focus of the epidemic. Whether any of the party were ill when they reached Trani is not known, but it has been ascertained that upon arrival they washed clothing in a vessel used for drawing water from a well and that in due course there followed cases of choleriform disease, the true nature of which was not at first recognized. The infection spread to various towns and cities in the Provinces of Bari and Foggia, both in the region of Apulia. Up to August 28 the disease had made its appearance in the following places: In the Province of Bari, at Andria, Trani, Corato, Bitonto, Spinazzola, Barletta, Bari, and Bisceglie. In the Province of Foggia at Cerignola, Trinitapoli, San Ferdinando di Puglia, and Margherita di Savoia.

CHOLERA IN AUSTRIA-HUNGARY.

On June 20, 1910, a case of cholera, apparently imported from Russia, was reported at Padwoloczyska in Galicia. August 31 two cases were reported at Vienna in persons recently arrived from Hungary. September 13 isolated cases of cholera were reported in eight villages, from Kressburg to Mohacs, on the Danube.

GEOGRAPHICAL DISTRIBUTION OF CHOLERA—JULY 1, 1909, TO JUNE 30, 1910.

During the past year cholera has been reported in all the countries in which it existed during the fiscal year 1909. In addition it invaded Belgium, Germany, Java, Manchuria, Netherlands, Siberia, and Sumatra. Its distribution during the year July 1, 1909, to June 30, 1910, was as follows: In Asia—in Ceylon, China, India, Indo-China, Japan, Java, Korea, Manchuria, Persia, Siam, Siberia, and the Straits Settlements; in Europe—in Belgium, Germany, Netherlands, Russia, and Austria-Hungary. Since June 30, 1910, it has also invaded Italy.

CHOLERA ON VESSELS.

During the year cholera has been reported on vessels as follows: One case at Hartlepool, England, from a Danish steamer, September 20, 1909. Cases were reported in Japan from the steamship *Taian Maru;* I case at Kobe, Japan, from steamship *Nile*, July 21, 1909; 1 case at Dalny, Manchuria, from steamship *Kobe Maru*, August 11, 1909; 1 case on steamship *Othello* en route from Bassein to Colombo; 1 case at Colombo from steamship *Nubia*, April 28, 1909; 2 cases on steamship *Tamboura* en route to Suez, April 14 to May 1, 1909; 1 case at Friedershold, Norway, from a vessel from Riga, Russia, December 31, 1909; 50 cases were reported on a coasting vessel in the Philippines February 12, 1910; 1 case at Cavite from steamship *Yaptico*, November 20, 1909; 1 case at London, England, from steamship *Industrie*, September 14, 1909.

PLAGUE IN THE UNITED STATES.

During the year (July 1, 1909, to June 30, 1910) there have been but four cases of plague in man in the United States. Three of these occurred in Alameda County—one at Oakland October 26, and two at Sunol, one August 2 and one September 24, 1909. One occurred at Hollister, in San Benito County, June 5, 1910. One plague-infected rat was found at Seattle February 8, 1910. One infected wood rat, or dusky-footed brush rat, was found October 17, 1909, in Alameda County, Cal. Three hundred and forty-three plague-infected squirrels were found in 10 counties in California.[1]

PLAGUE—FOREIGN AND INSULAR.

Plague has continued to be reported from all the countries in which it existed in 1909 with the exception of Argentina and the British Gold Coast. In addition, during the fiscal year 1910, 6 deaths from this disease were reported on Bahrein Island, in the Persian Gulf, and 5 deaths among the troops at Casablanca, in Morocco. Since the beginning of the present pandemic in 1894 plague had not previously been reported from either of the above two places. Plague was also reported from Arabia, Paraguay, Persia, and the Territory of Hawaii, localities in which it had not been reported during 1909, although it had been previously reported in Arabia and Hawaii in 1908, and in Paraguay and Persia in 1907. In Russia but 1 case was reported in 1909, whereas in 1910 there were 494 cases. In India during the fiscal year, covered by this report, 471,588 cases and 403,087 deaths were reported. This is a considerable increase over the preceding 12 months, when there were but 168,403 cases and 133,626 deaths.

GEOGRAPHICAL DISTRIBUTION OF PLAGUE JULY 1, 1909, TO JUNE 30, 1910.

During the fiscal year 1910, plague has been reported as follows:

In Asia, in Arabia, China, India, Indo-China, Persia, Siam, Straits Settlements, Turkey, and Japan, and on Bahrein Island, in the Persian Gulf; in Europe, in Russia; in Africa, in British East Africa, Egypt, German East Africa, Morocco, and Zanzibar; in South America, in Brazil, Chile, Ecuador, Paraguay, Peru, Uruguay, and Venezuela; in North America, in the United States; in Australia, and in the following islands: The Azores, Mauritius, Trinidad, and Hawaii.

PLAGUE ON VESSELS.

Plague is known to be carried from continent to continent on vessels, and for this reason an enumeration of the cases of this disease reported on vessels is of special interest. The reports received during the year were as follows: One case at Bunbury, Australia, from steamship *Zoroaster*, June 4, 1909; 1 case at Honolulu, from steamship *Korea*, June 20, 1909; 3 cases at Honolulu, from steamship *Nippon Maru*, June 3, 1910; 4 cases at Pescadores Islands, from steamship *Lodore*, July 3, 1909; 1 case at Aden, Arabia, from mail steamer from Bombay, January 23, 1910; 1 case at Aden, Arabia, from steamship *Hindos*, May 4, 1910; 3 cases at Perim Island, Arabia, from steamship *Hindos*, May 4, 1910; 1 case at Santos,

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[1] For detailed account of plague in the United States see pp. 174, 187.

Brazil, from bark *Amazone*, December 1, 1909; 1 case at Lima, Peru, from steamship *Ammon*, February 25, 1910; 1 case at Pisco, Peru, from steamship *Ammon*, February 19, 1910; 2 cases removed at Suez from steamship *Statesman*, September 20, 1910; 1 case at Callao, Peru, from steamship *Victoria*, May 12, 1910; 1 case at Callao, Peru, from steamship *Nicarie*, May 19, 1910.

YELLOW FEVER.

During the year yellow fever has prevailed less extensively than usual. In South America it has been reported in Brazil at Bahia, Manaos, Para, and Pernambuco; in British Guiana at Suddie; in Ecuador at Babahoyo and Guayaquil; in Central America, in Costa Rica at San Jose and Limon and in Nicaragua at Managua; in North America, in Mexico at Merida, Peto, Santa Cruz de Bravo, and Tekik; in the West Indies, on the islands of Barbados and Trinidad; in Africa, in the Gold Coast of Sekondi and in Sierra Leone at Freetown and Sherboro.

The countries in which yellow fever was reported in 1910, but which had been apparently free from the disease in 1909, were British Guiana, the Gold Coast, Sierra Leone, Costa Rica, and Nicaragua.

The countries and places which were apparently free from the disease in 1910, but in which it had been reported in 1909, were Colombia, Dutch Guiana, Honduras, Cuba, Curacao, Martinique, and St. Vincent.

Rio de Janeiro, Brazil, has for years been an endemic center of yellow fever, but owing to an aggressive campaign which has been waged since April, 1903, for the suppression of the disease, no deaths from yellow fever have been reported in the city since 1908.

TYPHUS FEVER.

Typhus fever has prevailed in epidemic form in many places in Russia. Among the cities which suffered especially from this disease were Kief, Rostov, Kharkov, and Riga.

A disease closely resembling and in all probability identical with typhus fever has been prevalent in the highlands and plateaus of Mexico for several years. Many cases of this disease, which, according to recent work, appears to be spread by the body louse, have occurred in Mexico City.

MARINE HOSPITALS AND RELIEF.

Relief to Seamen.

During the fiscal year 51,451 seamen were treated at the various stations of the service. Of these 14,278 were treated in hospitals and 37,173 were treated as out-patients. The total number of days' hospital relief furnished seamen was 431,685.

Eight hundred and forty-four seamen from foreign vessels were treated. The total number of days' hospital relief furnished these seamen was 10,717.

Relief Stations.

The service operated 22 hospitals, all of which are owned by the Government, and maintained 125 other relief stations, where hospital and dispensary relief were furnished.

The marine hospital at Buffalo, N. Y., has been completed and equipped and was opened for the reception of patients in September, 1909.

The marine hospital at Pittsburg, Pa., has been completed and was opened for the reception of patients October 22, 1910.

The Secretary of the Treasury on June 4, 1910, under authority of section 4805, Revised Statutes, page 934, ordered the sale at public auction of the marine hospital buildings and grounds at Cincinnati, Ohio.

The plans for the reconstruction and additional buildings for the marine hospital at New York have been completed and are awaiting approval of the supervising architect.

A bill has been introduced in the House of Representatives, February 7, 1910, providing $750,000 for the purchase of a site and the erection thereon of suitable building or buildings for marine-hospital purposes at San Francisco, Cal. The provisions of this bill were approved by the department.

Relief to Sufferers from the Fire in Chelsea, Mass.

During the year the relief furnished at the marine hospital at Chelsea to certain accident, emergency, and maternity cases, under act of Congress approved May 23, 1908, accommodations for which in the city of Chelsea were destroyed by fire in April, 1908, was continued until November 1, 1909.

The following statement shows the number of cases treated on this account:

Enteric fever	3	Contusions:	
Fracture:		Face	1
Radius	1	Back	1
Radius and ulna	1	Wounds:	
Skull	1	Hand	1
Ribs	1	Foot	1
Femur	1	Inflammation of connective tissue	1
Syncope	1		
		Total	14

The number of days during which these patients were treated was 161.

RELIEF TO NATIVES OF ALASKA.

The medical officers of the service detailed to vessels of the Revenue-Cutter Service cruising in Alaskan waters have furnished medical and surgical relief to many natives needing the same at the different ports visited.

AID TO OTHER BRANCHES OF THE GOVERNMENT.

Revenue-Cutter Service.—One thousand two hundred and forty-seven men were examined physically, of whom 148 were rejected.

Steamboat-Inspection Service.—Nine hundred and nineteen pilots were examined as to visual capacity, of whom 35 were rejected.

Life-Saving Service.—One thousand seven hundred and eighty-nine keepers and surfmen were physically examined, of whom 62 were rejected.

Four hundred and sixty-one disability certificates, referred by the General Superintendent of the Life-Saving Service, were acted upon by direction of the Surgeon General. These called for the expression of opinion upon the medical evidence of disability submitted in claims for benefits under the act of March 4, 1882; upon the physical fitness of keepers and surfmen for enlistment and reenlistment; and upon evidences of death submitted by widows or orphans in their claims for benefits.

Seventeen acting assistant surgeons were continued on duty for the examination of keepers and surfmen at points not easily accessible to regular officers at stations of the service.

In addition, three commissioned officers were detailed during July, 1909, at the request of the general superintendent, to various points along the coast for the purpose of examining candidates for admission to the Life-Saving Service.

Coast and Geodetic Survey.—One hundred and ninety-nine employees and applicants for appointment were examined, and 37 were rejected.

Lighthouse Service.—Forty-four applicants for enlistment were examined, and 3 were rejected.

Immigration Service.—Ninety-five persons connected with the Immigration Service were physically examined, and 8 were rejected.

Civil Service Commission.—Ninety-two applicants for appointment were physically examined, and 4 rejected.

Isthmian Canal Commission.—Seven employees and applicants for appointment were physically examined. None were rejected.

Post Office Department.—In addition to the above, upon the request of the Postmaster General, physical examinations were made at different places in the country, of 22 railway mail clerks, with a view to determining whether they were afflicted with tuberculosis.

PHYSICAL EXAMINATION OF MERCHANT SEAMEN.

Physical examinations were made of 133 American merchant seamen, of whom 16 were rejected, and 5 foreign seamen, of whom 3 were rejected.

PHYSICAL EXAMINATIONS, PHILIPPINE ISLANDS.

Physical examinations were made of 41 applicants in the United States to serve in the Islands, of which number 1 was rejected.

Purveying Depot.

The following statistics show the transactions of the purveying depot during the fiscal year:

SUPPLIES PURCHASED.

Drugs and chemicals	$13,389.83
Beds and bedding	13,098.45
Surgical instruments and appliances	10,378.17
Pharmacal implements, etc	3,632.92
Dry goods	2,225.34
Rubber goods	1,778.91
Alcohol, wines, etc	1,721.85
Books and journals	1,359.14
Flags	906.17
Bacteriological supplies	602.18
Packing boxes and sawdust	387.35
Total	49,480.31

CREDIT.

By bills paid direct from funds:		
Quarantine Service	$929.18	
Bureau (books and journals)	428.61	
Maintenance (journals)	404.00	
Care of seamen, etc	289.90	
Epidemic fund	83.48	
Hygienic laboratory	13.50	
		2,148.67
Total		47,331.64
By amounts reimbursed from other appropriations for supplies issued from stock:		
Quarantine service	$2,972.11	
Leprosy investigation station	1,383.10	
Epidemic fund	282.40	
Treasury Department	210.99	
		4,848.60
Net expenditures chargeable to appropriations for purveying depot (in amount $43,000)		42,483.04
Salaries	$6,040.00	
Rent	3,250.00	
Operating expenses	387.50	
		9,677.50
Total net expenditures		52,160.54

Number of requisitions filled		309
Number of packages shipped		4,090
Total weight of supplies shipped	pounds	283,565

Tuberculosis Sanatorium at Fort Stanton, N. Mex.

Passed Asst. Surg. H. S. Mathewson, in charge, reports as follows regarding the transactions of the sanatorium for the fiscal year ended June 30, 1910:

ADMISSIONS.

During the year admission of patients to this sanatorium numbered 149 as compared with 205 admissions for the previous year. There were under treatment July 1, 1910, 154 as compared with 211 July 1, 1909. This falling off in admissions may be only temporary, or may be the result of the segregation of the tuberculous seamen and their elimination from vessels and boarding houses, where the infection of their fellows follows as a matter of course. Statistics published by Surg. G. B. Young, of this service, in the Journal of the American Medical Association, April 16, 1910, on "Admission rate for tuberculosis among merchant seamen for the past twenty years," are encouraging, showing, as they do, that the service treated in 1898, the year before this sanatorium was opened, a total of 1,064 consumptive seamen, while 10 years later, in 1908, the number had fallen to 499. It is also believed that instructions issued during the year, as to the class of cases suitable for transfer to this station, have been productive of good, in the elimination of certain cases unfit for transfer. The following figures as to condition on arrival support this view:

	1909	1910
Good	46	30
Fairly good	20	18
Fair	70	62
Poor	61	34
No examination	1	3
Nontubercular (lungs)	7	2
Total	205	149

During the year there were 4 deaths within 30 days after arrival at Fort Stanton, as compared with 8 last year.

TENT HOUSE, CLASS B.

A change in the housing of the ambulant patients has been made during the year by the substitution of the tent house, class B, for the canvas-covered tent houses formerly in use. Thirty-two of the class B type are now in use. Tent house, class B, is equipped with permanent roof, covered with Amazon roofing, canvas being used only to cover a space 2 feet 6 inches along three sides of the tent house. These side curtains are rolled up, except during storms, and the ventilation so provided appears to be ample. This tent house can be constructed here for $63.16, as compared with $70.48, the cost of the old canvas-covered tent house, and it gives promise of a longer period of service. It promises further advantages in being cooler during the day, with less noise during storms, and is less liable to leak and suffer damage during the high winds prevailing during the spring months.

The bureau hopes to be able to continue the substitution of the class B tent houses in place of the canvas-covered ones, as they have proved to be more adapted to the needs of this station.

REPAIRS TO BUILDINGS.

The medical officer in command recommends that building No. 30 be converted into an amusement hall, to be equipped with a box-ball alley, shuffle board, and pool table, for the benefit of the patients. This recommendation is worthy of careful consideration, on account of the isolation of the station and the importance of providing mental diversion and amusement for the patients.

Repairs are also urgently needed on building No. 16, used as attendants' quarters. The roof of this building leaks, footings and side walls are in bad repair, and general overhauling of the building is necessary.

PROFESSIONAL WORK.

Special attention has been devoted to the professional care and treatment of those patients who have been transferred to the sanitarium. A larger number than ever before, 91 in all, have been discharged either " apparently cured " or with the disease " arrested." These two classes are the only criterion upon which can be based the success of the methods of treatment adopted. A few of those leaving after only a short stay and in whom the condition may be said to have " improved " may progress elsewhere to a " cure."

A series of cases are being treated at present with autogenous vaccines, made in the laboratory at this station, and the results so far obtained seem promising in the limited number of cases under treatment.

Besides a large volume of routine laboratory work, special investigations of the water supply of the reservations have been made.

At present the dairy herd is being tested out individually, as to the production of milk and butter fat, and looking toward the elimination from the herd of cattle maintained at a loss.

STATISTICS.

Patients under treatment July 1, 1909	211	
Patients admitted during the year	149	
		360
Patients under treatment July 1, 1910	154	
Patients discharged during the year	206	
		360
Ages of patients treated during the year:		
Under 25 years	54	
Between 25 and 34 years	125	
Between 35 and 44 years	103	
Between 45 and 54 years	52	
Over 54 years	21	
Nontubercular (lungs)	5	
		360
Heredity in patients treated during the year:		
History of tuberculosis in parents	58	
No history of tuberculosis in parents	261	
History of tuberculosis in parents doubtful	35	
Nontubercular (lungs)	6	
		360
Stage of disease in patients admitted:		
Incipient	9	
Moderately advanced	60	
Far advanced	75	
Nontubercular (lungs)	2	
No examination	3	
		149

General condition on arrival:		
Good	30	
Fairly good	18	
Fair	62	
Poor	34	
No examination	3	
Nontubercular (lungs)	2	
		149
Tubercle bacilli in sputum:		
Present in	124	
Not found in	20	
No examination	3	
Nontubercular (lungs)	2	
		149
Record of pulmonary hemorrhages in patients admitted:		
Before arrival only	39	
After arrival only	3	
Both before and after arrival	9	
Neither before nor after arrival	62	
Streaked sputum	31	
No examination	3	
Nontubercular (lungs)	2	
		149
Greatest number of patients under treatment at one time during the year		218
Condition of 206 patients at time of discharge:		
Apparently cured	40	
Arrested	51	
Improved	29	
Unimproved	28	
Died	54	
Discharged cases nontubercular (lungs)—		
Apparently cured	1	
Improved	1	
Died	2	
		206

DURATION OF STAY AND CHARACTER OF CASES.

Character of cases.	Longest stay.			Shortest stay.		Average stay.		
	Yrs.	*mos.*	*dys.*	*Mos.*	*dys.*	*Yrs.*	*mos.*	*dys.*
Apparently cured	3	0	4		[1]8	1	1	2
Arrested	8	3	9	2	15	1	9	19
Improved	2	9	18	1	25		10	29
Unimproved	2	8	13		29		11	17
Death	7	9	13		2	1	1	14

[1] Patient readmitted for observation.

(Does not include 4 nontubercular (lungs) cases.)

LIST A.—PATIENTS DISCHARGED WHO WERE UNDER TREATMENT AT BEGINNING OF FISCAL YEAR.

	Apparently cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Incipient	16	2				18
Moderately advanced	14	14	5	6	4	43
Far advanced	5	23	10	10	28	76
Cases discharged	35	39	15	16	32	137

LIST B.—PATIENTS DISCHARGED WHO WERE ADMITTED DURING THE YEAR.

	Apparently cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Incipient	1	2	1			4
Moderately advanced	4	5	8	6	1	24
Far advanced		5	5	6	18	34
Cases discharged	5	12	14	12	19	62
No examination of 3 patients, all of whom died					3	3
Total					22	65

Lists A and B do not include four nontubercular (lungs) cases.

Patients under treatment July 1, 1909	211	
Patients discharged during the year from these	137	
Patients remaining from these		74
Nontubercular (lungs) discharged		3
Patients admitted during the year	149	
Patients discharged during the year from these	65	
Patients remaining under treatment from these		84
Nontubercular (lungs) cases discharged		1
Length of time under treatment at sanatorium of the 206 discharged cases:		
Over 2 years	34	
Between 1 and 2 years	40	
Between 6 and 12 months	63	
Between 3 and 6 months	35	
Under 3 months	30	
Nontubercular (lungs)	4	
		206

Of the patients discharged during the year, 6 were under treatment for less than 30 days.

Result:		
Apparently cured	1	
Unimproved	1	
Died	4	
		6
Cause of death of 56 patients dying during the year:		
Tuberculosis	54	
Other causes	2	
		56

During the year there were under treatment, in addition to the above, tuberculous officers and employees, as follows:

Under treatment July 1, 1909	8	
Admitted during the year	7	
		15
Remaining under treatment June 30, 1910	12	
Discharged during the year	3	
		15
Condition of tuberculous employees at time of discharge:		
Arrested	2	
Unimproved	1	
		3
Number of physical examinations made during the year		1, 096

The routine work in the laboratory during the fiscal year comprises the following:

Examinations of sputum	1,826
Examinations of urine	1,062
Blood examinations for tubercle bacilli	8
Blood examinations in which acid-fast bacilli were found	3
Blood examinations for malarial parasite	4
Stools and urine examined for typhoid bacilli	119
Mice inoculated with sputum to determine presence of pneumococcus	113
Stools examined for parasites	3
Autogenous vaccines (nontuberculous) prepared	15
Doses of autogenous vaccines (nontuberculous) administered	47
Doses of stock vaccine (nontuberculous) administered	9

WATER SUPPLY.

During the past year there has been a further impairment of the water supply of this station. The station was supplied from the Bonito, through the reservoir and reservoir ditch, until January, 1910. During the fall the water storage capacity was increased by building an additional storage basin near the old reservoir, to the south of station. About the time of the completion of this new basin water in the Bonito failed, and no water to date has been available for storage.

In December, 1909, the El Paso & Southwestern Railroad Co. threw a dam across the main stream of the Bonito, about 1 mile below the forks, and by a branch pipe line leading into their main began the diversion of all the water of the Bonito. This diversion was soon felt at Fort Stanton, and since January, 1910, all water for domestic purposes has been pumped from two deep artesian wells, and the gravity water supply system has been out of use.

The station has been continuously on short rations of water for the past six months, the pumping capacity being about 20,000 gallons per day. No water was available for irrigation of alfalfa fields this spring; consequently, the first cutting of alfalfa amounted to but 16 tons instead of 117 tons—the first cutting of 1909. A small amount of water rising from springs at the intake of the garden ditch has been used to irrigate the gardens, but the acreage planted this year is only about one-half that of former years, and no water has been available for irrigation of the orchard.

The range herd has watered from pools along the Bonito, although at all times this water has been dangerously low. A few hundred head of this herd have watered since May at the trough placed in the horse pasture, as water has entirely vanished from the Bonito for the last 3 miles of its course at the eastern end of the reservation. Recommendations as to furnishing the range with bored wells, pumped by wind mills or gasoline engines, was made the subject of a separate report by the medical officer in command.

PRODUCTS OF THE STATION.

Dairy.—During the year the dairy supplied the station with 35,365 gallons of milk and 778 pounds of butter. The production of milk has fallen off, as the old thoroughbred cattle are dying of old age and the younger stock are half-breeds.

The station has recently been furnished with a Babcock milk tester and a register of the herd established.

The dairy herd supplied 2,583 pounds of veal during the year.

Beef herd.—The station was supplied with beef from the station herd for a period of nine months and the hides were sold for $602. The total amount of beef supplied was 59,183 pounds. At the close of the year there were 1,332 head, not counting calves dropped this spring; 118 have been slaughtered and 54 died from various causes.

Approximately 18,000 acres are under fence, 1,000 acres having been added during the past year. It will be necessary to fence in 10,000 additional acres in order to obtain sufficient pasturage.

Horses.—During the year 10 old horses either died or were killed and 5 young horses selected from the station herd and broken. There were at the close of the year, including young stock, 66 head. A limited amount of breeding is being done.

Poultry.—Fifty Leghorn hens were added to the poultry yard and chickens and eggs to the value of $67.18 were supplied the station.

Hogs.—Ninety-six hogs were slaughtered, supplying the station with 9,383 pounds of pork.

Farm and garden.—The station was supplied with considerable quantities of fresh vegetables from the station gardens, of great value on account of the difficulty often encountered in securing the same in a fresh condition.

The orchard yielded 2,621 pounds of apples, the first crop harvested at this station.

The total yield of alfalfa for the season 1909 was 232.74 tons harvested as hay. Two silos have been constructed. One was filled with 80 tons of corn ensilage and the other with about 60 tons of the third cutting of alfalfa and with green oat fodder.

The dairy cattle were fed ensilage from October, 1909, to May, 1910, cutting the expenditures for bran and corn about $729.95 below the amount spent for the same last year. This saving can be partly credited to ensilage feeding.

PERSONNEL.

Commissioned and Other Officers.

The commissioned medical officers at the beginning of the fiscal year, July 1, 1909, numbered 128, as follows: The Surgeon General, 5 Assistant Surgeons General, 35 surgeons, 66 passed assistant surgeons, and 21 assistant surgeons.

At the close of the fiscal year, June 30, 1910, the total number was 128, consisting of the Surgeon General, 6 Assistant Surgeons General, 34 surgeons, 66 passed assistant surgeons, and 21 assistant surgeons.

The changes during the year were as follows: Three assistant surgeons were promoted to the grade of passed assistant surgeon and 6 candidates, who passed the examination required by the regulations, were commissioned as assistant surgeons. One surgeon, 2 passed assistant surgeons, and 3 assistant surgeons resigned. On account of physical disability 2 surgeons and 1 passed assistant surgeon continued on "waiting orders."

Assignments.—Among other assignments of commissioned medical officers during the fiscal year were the following: Seventeen were assigned to exclusive immigration duty, their services being supplemented by employment of acting assistant surgeons; 6 to the quarantine service of the Philippine Islands; 5 to vessels of the Revenue-Cutter Service; 23 to the quarantine stations in the continental United States, Porto Rico, and the Hawaiian Islands; 6 to duty in foreign countries to prevent the introduction of epidemic disease into the United States.

Special details.—Two commissioned medical officers continued on detail duty with the Isthmian Canal Commission. Passed Asst. Surg. V. G. Heiser, in addition to his duties as chief quarantine officer, has been continued as director of health of the Philippine Islands, and Passed Asst. Surg. A. J. McLaughlin as assistant director of health. Passed Asst. Surg. H. B. Parker, under the act of Congress approved February 15, 1893, has been assigned for duty at Guayaquil, Ecuador, vice Passed Asst. Surg. B. J. Lloyd, relieved.

Personnel, Hygienic Laboratory.—At the close of the fiscal year there were on duty in the Hygienic Laboratory, in addition to the director, assistant director, and 2 chiefs of divisions, 9 passed assistant surgeons, 2 pharmacists, 1 artist, 8 technical assistants, and 28 attendants.

Acting assistant surgeons.—At the beginning of the fiscal year there were 279 acting assistant surgeons on duty; 322 were appointed, 3 died, 324 were separated from the service by limitation of appointment, resignations, and removals, leaving on duty at the close of the fiscal year 274 such officers.

Medical inspectors.—Two female inspectors served during the entire year for the inspection of women passengers—1 at Honolulu, Hawaii, and 1 at San Francisco quarantine station.

Internes.—There were 11 internes on duty July 1, 1909, at the various marine-hospital stations; 1 died, 18 were appointed, and 13 were separated from the service by reason of resignation, leaving 15 on duty at the close of the fiscal year.

Pharmacists.—At the beginning of the fiscal year there were on duty 45 pharmacists, divided as follows: Pharmacists of the first class, 16; second class, 20; third class, 9. One pharmacist of the second class died, and 3 of the third class resigned; 5 pharmacists of the third class were appointed, and 3 pharmacists of the third class were promoted, leaving at the close of the fiscal year 46 pharmacists on duty as follows: Pharmacists of the first class, 16; second class, 22; third class, 8.

Pilots and marine engineers.—There were on duty at the beginning of the fiscal year 16 pilots and 21 engineers; 3 pilots resigned, 1 was separated from the service, and 5 were appointed; 3 marine engineers resigned, 2 were separated from the service, and 4 were appointed. The number on duty at the close of the fiscal year were as follows: Pilots, 17; marine engineers, 20.

Hospital and Quarantine Attendants.

At the beginning of the fiscal year 978 attendants were employed at the various marine hospitals, quarantine stations, and on epidemic duty, including 74 on duty in the Philippine Islands. At the close of the fiscal year there were so employed as follows:

Branch of service in which employed.	In service July 1, 1909.	Appointed during year.	Separated from service.	In service June 30, 1910.
Marine-Hospital Service	449	702	702	449
Quarantine (including Porto Rico and Hawaii)	359	215	243	331
Epidemic	170	150	200	120
Total	978	1,067	1,145	900
Philippine Islands	74	25	28	71

RECAPITULATION.

	On duty June 30, 1910.
Commissioned medical officers	128
Chiefs of divisions, Hygienic Laboratory	2
Artist	1
Technical assistants	8
Sanitary inspector	1
Quarantine inspector	1
Acting assistant surgeons	274
Medical inspectors	2

	On duty June 30, 1910.
Internes	15
Pharmacists	46
Pilots	17
Marine engineers	20
Attendants	900
Laborers	8
Total	1,423

Boards Convened.

Thirty-five boards were convened during the fiscal year at the various stations throughout the United States for the physical examination of officers of the Revenue-Cutter Service and applicants for entrance therein. Two boards were convened for the examination of assistant surgeons to determine their fitness for promotion to the grade of passed assistant surgeon; ten for the physical examination of detained aliens; three for the examination of pharmacists, to determine their fitness for promotion to a higher grade; two for examination of applicants for entrance as assistant surgeons; and one board to revise the United States Quarantine Regulations.

The bureau sanitary board has been convened in 13 sessions to pass upon reports of inspections of establishments engaged in the manufacture of vaccines, serums, toxins, etc., prior to recommending a license; and to pass upon advertised remedies and appliances to determine if said advertisements should be excluded from the mails.

SERVICE PUBLICATIONS.

During the year ending June 30, 1910, 364,306 copies of the various service publications have been distributed, as compared with 246,000 for the previous year. These include: Annual report, weekly Public Health Reports, reprints from Public Health Reports, Public Health bulletins, Hygienic Laboratory bulletins, bulletins of the Yellow Fever Institute, and the Transactions of the Annual Conference with State Health Authorities.

Seven thousand three hundred and ninety-two written requests were received, in most instances for more than one publication. During the previous year 2,991 requests were received. This increased demand is partly explained by the interest that is becoming manifest in public health and sanitary matters in general. These requests are supplied in addition to the regular mailing lists.

Special Articles.

Fifty-one special articles or reviews of especial interest, mainly by officers of the service, have appeared during the year in the weekly Public Health Reports. Fifteen were reprinted as separates in order to supply the demand made for them.

The following is a list of the special articles, with the exception of those which were published as reprints:

Siphonaptera Observed in the Plague Campaign in California, with a Note upon Host Transference. McCoy and Mitzmain. July 16, 1909.

Pellagra in Italy. Wollenberg. July 23, 1909.

Report on Progress made in the Organization of Colored Antituberculosis Leagues. Wertenbaker. August 6, 1909.

Measures against Leprosy in the Philippine Islands. Heiser. August 13, 1909.

Table Showing Plague-infected Ground Squirrels and their Location in Contra Costa County, between June 4 and August 13, 1909.

Pellagra in the State Hospital for the Insane at Peoria, Ill. Lavinder. September 17, 1909.

Cholera in Rotterdam. Wollenberg. September 17, 1909.

Report of the Transactions of the International Commission for the Revision of the International Classifictaion of the Nomenclature of Diseases and Causes of Death held in Paris in July, 1909. Geddings. September 24, 1909.

Amœbic Dysentery in San Francisco, Cal. Austin. September 24, 1909.

Report on the Twelfth International Congress on Alcoholism and the Sixteenth International Medical Congress. Hunt. October 8, 1909.

Pellagra as Observed at the South Atlantic and Cape Fear Quarantine Stations. Bryan. October 8, 1909.

A Report on the Prevention of the Pollution of Streams by Pulp Factories in Germany. Consul W. Washington Brunswick, Chemnitz, Germany. October 15, 1909.

A Report on School Physicians in Germany. Consul G. N. Ifft, Nuremberg, Germany. October 15, 1909.

Milk Supply of Buenos Aires, Argentine Republic. Kerr. October 22, 1909.

The Sanitation of Rotterdam. Wollenberg. October 22, 1909.

The National Conference on Pellagra, held at Columbia, S. C., November 3 and 4, 1909. Lavinder. November 12, 1909.

Prophylaxis of Yellow Fever. Received from the Department of State from George E. Anderson, American consul general at Rio de Janeiro, Brazil. November 19, 1909.

Mercuric Chloride as an Insecticide. Guiteras. December 10, 1909.

On the Relation of Rocky Mountain Spotted Fever to the Typhus Fever of Mexico. A Preliminary Note. Anderson and Goldberger. December 10, 1909.

Statement of the Sanitary Condition of Seattle, Wash. Glover. December 17, 1909.

A Note on the Etiology of "Tabardillo," the Typhus Fever of Mexico. Anderson and Goldberger. December 24, 1909.

Note on Plague Infection in a Wood Rat (Neotoma Fuscipes Anectens, Elliot). Rucker. January 7, 1910.

Prevention of Malaria. Taken from a report on malaria investigations in the Island of Mauritius by Prof. Ronald Ross, of the University of Liverpool. January 21, 1910.

On the Infectivity of Tarbardillo, or Mexican Tuphus, for Monkeys and Studies on its Mode of Transmission. Anderson and Goldberger. February 18, 1910.

Fourth International Sanitary Conference of the American Republics. Von Ezdorf. February 25, 1910.

Frequency of Hookworm Disease, or Ground Itch Anemia, Among Public-School Children in Southern Florida. Stiles. March 25, 1910.

Hookworm Disease in Three Cotton Mills in North Carolina. Stiles. March 25, 1910.

The "Reader" as a Possible Public Health Agency in Cigar Factories. Stiles. March 25, 1910.

A Parasitic and a Predatory Enemy of the Flea. Mitzmain. April 1, 1910.

The Opening of a National Campaign on Oral Hygiene. April 8, 1910.

A Note on Squirrel Fleas as Plague Carriers. McCoy. April 15, 1910.

Condemnation of Insanitary Premises in San Francisco, Cal. Converse. April 15, 1910.

Results of Microscopic Examinations for Hookworm Disease in a Public School in Richmond County, Va. Stiles. April 22, 1910.

The Sanitary Privy.[1] Stiles. April 29, 1910.

Fleas as Plague Carriers Between Rats and Ground Squirrels. McCoy. May 20, 1910.

Health of School Children at Leeds, England. Consul Chase. May 20, 1910.

The Theory of the Parasitic Origin of Pellagra. Lavinder. June 3, 1910.

Fleas Collected from Squirrels from Various Parts of California. McCoy. June 3, 1910.

REPRINTS FROM PUBLIC HEALTH REPORTS.

The weekly Public Health Reports are issued in editions of 4,000, an increase of 300 over the past year. These reports are distributed chiefly to health officers and other sanitary authorities in accordance with section 4 of the act of Congress approved February 15, 1893.

The special articles which have appeared from time to time in the Public Health Reports have attracted considerable attention, and the requests made on the bureau for numbers of them for distribution for educational purposes has necessitated the reprinting of several of them.

The following is a list of reprints during the year and the editions of each:

No. 32. Campaign against Ground Squirrels in Contra Costa County, Cal. (1,000.)

No. 33. Colored Antituberculosis League. Proposed Plan of Organization. (3,000.)

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[1] The Sanitary Privy was later published as Public Health Bulletin 37.

No. 34. Prevalence of Pellagra in the United States. (3,500.)

No. 35. Epidemic of an Urticarioid Dermatitis, etc. (2,000.)

No. 36. Hookworm Disease and its Relation to the Negro. (6,000.) 2 editions.

No. 37. Treatment of Hookworm Disease. (6,000.) 2 editions.

No. 38. Plague among Ground Squirrels in Contra Costa County, Cal. (6,000.)

No. 39. A Working Plan for Colored Antituberculosis Leagues. (3,000.)

No. 40. Notes on the Prognosis and Treatment of Pellagra. (7,000.) 2 editions.

No. 41. The Second International Conference on Leprosy. (5,000.)

No. 42. Soil Pollution and its Relation to Hookworm Disease and Typhoid Fever. (7,000.) 2 editions.

No. 43. The Prophylaxis of Pellagra. (5,000.) 2 editions.

No. 44. Summary of Transactions of the Public Health and Marine-Hospital Service, Fiscal Year 1909, and to November 1, 1909. (2,000.)

No. 45. The Evidence of Plague Infection Among Ground Squirrels. (3,000.)

No. 46. What the Local Health Officer can do in the Prevention of Typhoid Fever. (3,000.)

No. 47. Straw Itch. (3,000.)

Since the close of this fiscal year a number of reprints of special importance have appeared and will be given by title.

On account of the recent outbreak of cholera in Italy and Russia, and the dangers of its spread to the United States, a special article on cholera has been prepared by Passed Asst. Surg. A. J. McLaughlin, who had had a wide experience with this disease while detailed as assistant director of health of the Philippine Islands. A supply of this article, reprinted from the Public Health Reports, has been sent to the secretaries of each State board of health for distribution to local health officers.

The following are those reprints which have appeared since July 1, 1910:

No. 48. What the Mayor and City Council Can Do in the Prevention of Typhoid Fever. By L. L. Lumsden.

No. 49. The Present Organization and Work for the Protection of Health in the United States. By Walter Wyman.

No. 50. The History, Development, and Statistics on Milk Charities in the United States. By J. W. Kerr.

No. 51. Pulmonary Hemorrhage in the Tuberculous at High Altitudes. By F. C. Smith.

No. 52. Bacteriological Procedure in Suspected Cholera, With Report of a Positive Cure. By J. F. Anderson and A. M. Stimson.

No. 53. Cholera: Its Nature, Detection, and Prevention. By A. J. McLaughlin.

No. 54. Preliminary Note on a Simple and Inexpensive Apparatus for the Safe Disposal of Night Soil. By L. L. Lumsden, Norman Roberts, and C. W. Stiles.

No. 55. The Field Investigation of Epidemic Poliomyelitis (What the Health Officer Can Do Toward Solving a National Problem). By W. H. Frost.

PUBLIC HEALTH BULLETINS.

These were spoken of in the report for last year as "public health pamphlets or brochures," and were heretofore listed as "Miscellaneous publications." They are published under authority of section 4 of the act approved February 15, 1893, and also under the acts making appropriations for sundry civil expenses of the Government for public printing and binding "for the Treasury Department."

The Public Health Bulletins are to be distinguished from the Reprints from Public Health Reports. Previous bulletins of this character have been numbered to and including No. 22.

The following have been received since the close of the last fiscal year:

No. 23. Pellagra—A Precis. (5,000.) Second edition.

No. 24. The Marine-Hospital Sanatorium, Fort Staunton, N. Mex. (4,000.)

No. 25. Hookworm Disease. Reprint from Annual Report 1908. (2,000.)

No. 26. Studies Upon Leprosy. (3,500.)
  I. The Present Status of Leprosy Problem in Hawaii.
  II. The Reaction of Lepers to Moro's "Percutaneous" Test.
  III. A Note Upon the Possibility of the Mosquito Actint in the Transmission of Leprosy.

No. 27. Studies Upon Leprosy. (4,000.)
  IV. Upon the Utility of the Examination of the Nose and the Nasal Secretions for the Detection of Incipient Cases of Leprosy.

No. 28. Studies Upon Leprosy. (4,000.)
  V. A Report Upon the Treatment of Six Cases of Leprosy with Nastine. (Deycke.)
  VI. Leprosy in the United States of America in 1909.

No. 29. The Prevalence of Rabies in the United States. (5,000.)

No. 30. The Rat and Its Relation to the Public Health. (4,000.)

No. 31. Transactions of the Seventh Annual Conference of State and Territorial Health Officers with the United States Public Health and Marine-Hospital Service. June, 1909. (700.)

No. 32. Hookworm Disease (or Ground-Itch Anemia), Its Nature, Treatment, and Prevention. (5,000.)

No. 33. Studies Upon Leprosy. (3,500.)
  VII. A Statistical Study of an Endemic Focus of Leprosy.
  VIII. A Palliative Treatment for Leprous Rhinitis.

No. 34. Maritime Quarantine. Appendix—Disinfectants Authorized by United States Quarantine Regulations and the Proper Method of Generating and Using Same. (2,500.)

No. 35. The Relation of Climate to the Treatment of Pulmonary Tuberculosis. (3,500.)

No. 36. Tuberculosis: Its Nature and Prevention. (4,000.)

No. 37. Sanitary Privy: Its Purpose and Construction. (5,000.)

No. 38. General Observation on the Bionomics of the Rodent and Human Fleas. (3,000.)

No. 39. Studies Upon Leprosy. (4,000.)
  IX. Mosquitoes in Relation to the Transmission of Leprosy.
  X. Flies in Relation to the Transmission of Leprosy.
  XI. Heredity versus Environment in Leprosy.

No. 40. Transactions of the Eighth Annual Conference of State and Territorial Health Officers with the United States Public Health and Marine-Hospital Service. April, 1910. (700.)

BULLETINS OF THE HYGIENIC LABORATORY.

Section 1 of the joint resolution of Congress approved February 24, 1905, provides:

> That there shall be printed each year the bulletins of the Hygienic Laboratory, not exceeding 10 in number in any one year, * * * in such editions, not exceeding 5,000 copies in any one year, as the interests of the Government and the public may require, subject to the discretion of the Secretary of the Treasury.

The extent of the research and scientific investigations carried on at the Hygienic Laboratory at Washington is well shown by brief reviews of the following bulletins that have been prepared and published during the year.

No. 57, I. The presence of tubercle bacilli in the circulating blood in clinical and experimental tuberculosis. By John F. Anderson. *II. The viability of the tubercle bacillus.* By M. J. Rosenau.

The first paper contains a study to determine the presence of tubercle bacilli in the blood of cases of human tuberculosis and of experimentally infected animals. It was found that the bacilli could not be demonstrated in the blood of cases of human tuberculosis nor in experimental animals, with the exception of experimentally infected rabbits. In the blood of experimentally infected rabbits the bacilli were demonstrated, both by animal inoculations and by culture, this being the first instance in which they have been grown from the blood.

The second paper contains a review of the literature on the viability of the tubercle bacillus. The great importance of an exact knowledge of the various conditions under which the tubercle bacillus retains its viability and virulence is of the utmost practical importance in the fight that is being made to control this great plague. All the factors that have to do with the viability of the organism have been discussed and a great conflict of opinion on this question has been found.

No. 58. Digest of comments on the Pharmacopœia of the United States of America (eighth decennial revision) and the National Formulary for the period ending December 31, 1906. By Murray Galt Motter and Martin I. Wilbert.

The first bulletin of this series, No. 49, had reference more particularly to the United States Pharmacopœia. The addition of comments on the National Formulary was made in response to a resolution passed by the Council of the American Pharmaceutical Association at its last annual meeting (see annual report for the fiscal year 1908, p. 65). Bulletin 49 has been characterized by the Pharmaceutical Journal of London as "a summary replete with references to suggestions, criticisms, experimental data, and other matters pertaining to the chemistry, botany, pharmacognosy, physics, pharmacy, pharmacology, and commerce of official drugs," and it has been welcomed by the medical and pharmaceutical press of this country as a most valuable contribution to medical and pharmaceutical science. The publication of these bulletins at this time is particularly appropriate, in view of the decennial convention for the revision of the Pharmacopœia and the demand for a thorough revision of the National Formulary, furnishing, as they will, material not otherwise accessible to the revisers of these books which have acquired national importance through the enactment of the food and drug act of June 30, 1906.

No. 59. The oxidases and other oxygen-catalysts concerned in biological oxidations. By Joseph H. Kastle.

The oxidases and other oxygen catalysts occur almost universally in plant and animal tissues and are undoubtedly actively concerned in many biological oxidations. According to some authorities they have the power to destroy or at least render harmless certain toxins, and, according to others, they play an important rôle in the defense of the organism against pathogenic bacteria. Their reactions are such as to enable the chemist ofttimes to reach a correct conclusion regarding the condition or character of certain foodstuffs, viz, to determine whether they are raw or cooked, and also to determine whether a given sample of milk has been pasteurized or not.

No. 60. A study of the anatomy of Watsonius (n. g.) watsoni of man and of 19 allied species of mammalian trematode worms of the superfamily Paramphistomoidea. By Ch. Wardell Stiles and Joseph Goldberger.

This paper presents a most extensive and exact study of a group of 19 allied species of mammalian trematode worms, and clears up a number of points of importance not only in human but in comparative medicine. In addition, it places workers in a position in which it will be much easier to draw conclusions regarding the very important question of life history of this group.

No. 61. Quantitative pharmacological studies: Relative physiological activity of some commercial solutions of epinephrin. By William H. Schultz.

This paper gives the results of the investigation of the more widely used brands of epinephrin. Of seven different brands of this substance examined, only three possessed an activity that equaled the standard. The other solutions varied anywhere from 3.75 to 71 per cent of the required activity. As was shown very plainly, some of the solutions were, from the physician's standpoint, worthless and perhaps dangerous. Certain solutions, though showing a high degree of activity, upon opening the original package quickly deteriorated in spite of the extra precautions taken to guard against conditions known to further this process. On the other hand, it is shown that some of the preparations made by American concerns are of the very highest quality.

No. 62. The taxonomic value of the microscopic structure of the stigmal plates in the tick genus Dermacentor. By Ch. Wardell Stiles.

There has been considerable difficulty in distinguishing between the various species of ticks, owing to the fact that it has been hard to find good anatomical characters for differential diagnosis. Dr. Stiles has now found that the microscopical structure of the plate surrounding the pores through which these animals breathe is an exceedingly valuable character, which makes possible an immediate differentiation of a number of these forms. These observations, from the present outlook, are proving to be one of the most important observations made in recent years in the classification of the animals of this group. The practical importance of distinguishing between the different species of ticks becomes evident when it is recalled that various species of ticks act as transmitters of disease. The studies presented in this paper indicate that an observation has been made which will lead eventually to rather a radical revision of present ideas on the classification of the various species of ticks.

No. 63. Digest of comments on the Pharmacopœia of the United States of America (eighth decennial revision) and the National Formulary (third edition) for the calendar year ending December 31, 1907. By Murray Galt Motter and Martin I. Wilbert.

This bulletin is the third in the series of digests of comments on the eighth decennial revision of the United States Pharmacopœia and the National Formulary. It embraces the literature for the calendar year 1907, it being the first year after the enactment of the pure food and drugs act, and contains references which are now of special value and interest on account of the approaching revision of the Pharmacopœia.

No. 64. Studies upon anaphylaxis with special reference to the antibodies concerned. By John F. Anderson and W. H. Frost.

This paper contains studies upon the subject of anaphylaxis, with special reference to the mechanism of the phenomenon. It is the fifth from the laboratory upon anaphylaxis, which, it is now recognized, has a most important relation to the fundamental processes of immunity and resistance to disease. The studies which are set forth in this bulletin are concerned particularly with the antibodies which have to do with the production of anaphylaxis.

No. 65. Facts and problems of rabies. By A. M. Stimson.

This contains a résumé of our present knowledge concerning rabies and a discussion of the important problems confronting its students. It includes sections on the history, distribution, and prevalence of rabies; etiology, pathology, clinical features, diagnosis, treatment, prevention, and suppression of the disease. A full discussion is given of the Pasteur treatment and other methods for the prevention of rabies and the technique of their administration. It is believed that this bulletin will serve as an answer to the many inquiries which are frequently received concerning rabies, and play some part in exciting greater interest in the United States, with a view to the eradication of this disease.

No. 66. I. The influence of age and temperature on the potency of diphtheria antitoxin; by John F. Anderson. *II. An organism (Pseudomonas protea) isolated from water, agglutinated by the serum of typhoid fever patients;* by W. H. Frost. *III. Some considerations on colorimetry and a new colorimeter;* by Norman Roberts. *IV. A gas generator, in four forms, for laboratory and technical use;* by Norman Roberts.

I. This article gives the results, extending over a period of three years, of the influence of age and temperature upon the potency of diphtheria antitoxin. In view of this work it is probable that regulations may be promulgated to assist in the enforcement of the act of July 1, 1902, regulating the sale of viruses, serums, toxins, etc.

II. This paper contains the results of a study of a pseudomonas isolated from filtered Potomac water which is of interest chiefly because of its agglutination by typhoid fever serum. In its general biology, the organism is shown to resemble the proteus group commonly found in water.

III. This article describes a colorimeter which embraces a number of features that have not been utilized heretofore in colorimeters.

IV. This contains a description of a gas generator for laboratory and technical use. The apparatus therein described seems to have overcome the objections to the old forms and will probably be applicable to all the requirements of such a piece of apparatus.

No. 67. Solubilities of the pharmacopœial organic acids and their salts. By Atherton Seidell.

This bulletin contains the results of the determinations of the solubilities at 25° C. of a group of pharmacopœial compounds which has been very incompletely studied up to this time. The determinations were made in aqueous alcohol solutions of concentrations varying between 0 and 100 per cent ethyl alcohol and also in a large number of the commoner organic solvents. Analytical results upon the materials are given as well as descriptions of proposed new and modified methods of analysis. The solubility curves present almost every variety of form, and it is concluded that in no case is it possible to predict from the solubility of the substance in water and alcohol separately what it will be in any mixture of these two solvents.

No. 68. The bleaching of flour and the effect of nitrites on certain medicinal substances. By Worth Hale.

In this bulletin a short résumé of the divergent views regarding the artificial bleaching of flour is given. Following this are recorded certain chemical and physiological experiments, the results of which may be summed up as follows:

A deleterious action appears to result from the artificial bleaching of flour because of the lessened digestibility of the gluten of such flour, and possibly also because of the presence of definitely toxic substances, although these, it must be admitted, are present even in overtreated flour in only minute quantities.

Independently of these factors also the bleaching process may produce harmful results on account of the presence in flour bleached by such processes of small amounts of the nitrites. This action is exerted in two ways: by a decrease in the rate of proteid digestion and by changing other medicinal substances which may be taken at the same time into markedly toxic agents or by decreasing their normal action, or possibly through the chemical change, altering entirely their therapeutic effects.

No. 69. The effects of a restricted diet and of various diets upon the resistance of animals to certain poisons. By Reid Hunt.

This communication treats of the effects of a limited diet and of various diets upon the resistance to certain poisons. A number of experiments were performed with corn meal, these being preliminary to a fuller investigation of this food as possibly being involved in pellagra. It was shown that the resistance of animals to certain poisons is markedly influenced by articles of food which enter largely into the daily diet of man; some of these effects can be traced definitely to an influence upon the thyroid gland. The experiments show how undesirable effects of some foods may be compensated for by others.

No. 70. Report on an outbreak of typhoid fever at Omaha, Nebr. (1909–10). By L. L. Lumsden.

This report embraces a thorough epidemiological study of the outbreak of typhoid at Omaha, showing that the epidemic was extensive, and that, synchronous with its occurrence in Omaha, typhoid fever prevailed at an unusually high rate in a number of cities and towns along the Mississippi-Missouri watercourse. The investigation was thorough, and the methods followed in conducting it could be well applied in the study of typhoid outbreaks generally. The conclusions are definite and the recommendations specific. The findings point unmistakably to the water supply, obtained from the Missouri River, as having been the source of infection.

MISCELLANEOUS PUBLICATIONS.

This title has been given to those that can not properly be classed in the other series, and have been given an arbitrary number in the list of publications. Included here are the following:

1. Interstate Quarantine Regulations of the United States. September, 1894.
2. Instructions Relative to Care and Preservation of Quarantine Steamers and Boat Ceremony and Discipline. August, 1901.
3. Supply Table for the Marine-Hospital Service. Revised October, 1901.
4. Regulations for the Sale of Viruses, Serums, Toxins, and Analogous Products in the District of Columbia, etc., approved February 21, 1903. (Containing copy of "An act to regulate the sale of viruses, serums, toxins, and analogous products in the District of Columbia, to regulate interstate traffic in said articles, and for other purposes.") 8 pages. Paper. Out of print.
5. Book of Instructions for the Medical Inspection of Aliens. Revised January, 1910.
6. Regulations for the Government of the Public Health and Marine-Hospital Service of the United States. August, 1903.
7. Quarantine Laws and Regulations of the United States. Revised October, 1910.
8. Regulations Governing the Uniforms of Officers and Employees of the Public Health and Marine-Hospital Service of the United States. Revised 1904.
9. Handbook for the Ship's Medicine Chest. Second edition, September, 1904.
10. Regulations for the Sale of Viruses, Serums, Toxins, and Analogous Products in the District of Columbia and in Interstate Traffic. May 11, 1909.
11. Official List of Commissioned and Other Officers of the Public Health and Marine-Hospital Service of the United States. Also, List of United States Marine Hospitals, Quarantine Stations, and Quarantine Vessels. (Revised and reprinted in January of each year.)
12. List of Publications, Public Health and Marine-Hospital Service. January, 1910. Revised yearly.

NEEDS OF THE SERVICE.

Attention is again invited, as in the last annual report, to the necessity for a larger appropriation, or of a larger allotment out of the Treasury appropriation, for printing, in order that the various publications of the service may have wider distribution.

Some addition is also required to the office force for correctly maintaining the mailing lists and otherwise preparing service publications for the mails.

The second session of the present Congress adjourned without taking action upon any of the bills which were presented relating to the public health. One of these bills contained a provision for the increase of the compensation for the commissioned medical corps, and the necessity of this increase for the officers of the corps below the grade of assistant surgeon general is daily becoming more urgent. It is hoped that the third session of the Sixty-first Congress will give relief in this respect.

The financial statement and the usual statistical tables relating to the professional care of seamen and physical examinations are appended.

Respectfully submitted.

Walter Wyman,
Surgeon General.

Hon. Franklin MacVeagh,
Secretary of the Treasury.

APPENDIX.

FINANCIAL STATEMENT.

RECEIPTS AND EXPENDITURES, PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE, FOR THE FISCAL YEAR ENDED JUNE 30, 1910.

PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE, 1910.

	Appropriations and repayments.	Expenditures.	Balances June 30, 1910.	Less estimated outstandings.
Pay and commutation commissioned officers and pharmacists	$325,000.00	$299,025.42	$25,974.58	$897.31
Pay other employees	390,000.00	361,594.96	28,405.04	476.23
Freight and traveling expenses	35,000.00	26,112.05	8,887.95	4,566.45
Fuel, light, and water	70,000.00	62,636.06	7,363.94	1,012.72
Furniture and repairs	15,000.00	6,945.76	8,054.24	4,005.37
Purveying depot purchases	43,000.00			
Repayments	4,869.63	46,196.45	1,673.18	730.81
Rent, purveying depot	3,250.00	3,250.00		
Maintaining hygienic laboratory	15,000.00	12,115.22	2,884.78	2,811.77
Maintenance marine hospitals	240,000.00			
Repayments	12,121.42	226,951.32	25,170.10	9,692.82
Care of seamen and other purposes	130,000.00			
Repayments	703.39	118,178.21	12,525.18	815.09
Bureau, books	500.00	479.28	20.72	11.90
Total	[1]1,284,444.44	1,163,484.73	120,959.71	25,020.47

[1] Appropriations, $1,266,750; repayments, $17,694.44.

For expenditures by stations, see Statistical Table II.

QUARANTINE SERVICE, 1910.

Amount of appropriation	$400,000.00
Repayments, subsistence furnished, etc	1,343.52
Total	401,343.52
Expenditures	390,919.58
Balance June 30, 1910	10,423.94
Less outstanding liabilities, estimated	5,938.66

EXPENDITURES BY STATIONS.

Name of station.	Pay and allowances, officers and employees.	Subsistence and miscellaneous.	Medical and hospital supplies.	Total.
Alexandria, Va	$50.00	$5.58		$55.58
Beaufort, S. C	1,500.00	139.74		1,639.74
Biscayne Bay, Fla	1,575.00			1,575.00
Boca Grande, Fla	3,203.33	311.12	$16.63	3,531.08
Brunswick, Ga	3,480.55	1,469.27	74.17	5,023.99
Cape Charles, Va	8,907.46	7,641.72	145.72	16,694.90
Cape Fear, N. C	5,858.73	1,952.28	142.09	7,953.10
Cedar Keys, Fla	714.00			714.00
Charleston, S. C	6,314.00	939.52		7,253.52
Columbia River, Oreg	10,140.00	5,125.57	116.42	15,381.99

EXPENDITURES BY STATIONS—Continued.

Name of station.	Pay and allowances, officers and employees.	Subsistence and miscellaneous.	Medical and hospital supplies.	Total.
Coos Bay, Oreg	200.00	8.52		208.52
Cumberland Sound, Fla	3,565.00	77.78		3,642.78
Delaware Breakwater	4,419.99	1,610.12	13.91	6,044.02
Eureka, Cal	898.50	1,004.71	3.32	1,906.53
Florence, Oreg	200.00			200.00
Georgetown, S. C	709.17	66.38		775.55
Gulf, Miss	10,490.00	7,043.37	109.52	17,642.89
Hawaii	25,952.32	9,996.78	280.84	36,229.94
Key West, Fla	4,146.66	746.26	3.96	4,896.88
Miscellaneous		745.36		745.36
Mobile, Ala	10,723.43	5,776.93	444.74	16,945.10
Newbern, N. C	200.00	5.68		205.68
New Orleans, La	27,003.76	11,174.38	331.03	38,509.17
Newport, Oreg	200.00			200.00
Pascagoula, Miss	1,575.00	765.00		2,340.00
Pensacola, Fla	8,286.99	2,571.10	45.94	10,904.03
Perth Amboy, N. J	1,545.00	1,038.00		2,583.00
Port Hartford, Cal	380.00			380.00
Port Inglis, Fla	285.00	76.50		361.50
Portland, Me	7,243.19	1,418.34	88.09	8,749.62
Porto Rico	22,924.98	7,724.60	368.61	31,018.19
Port Royal, S. C	1,500.00	131.43	9.27	1,640.70
Port Townsend, Wash	15,760.34	3,138.29	73.96	18,972.59
Punta Rassa, Fla	325.00			325.00
Reedy Island, Del	16,053.78	10,585.04	39.77	26,678.59
St. George Sound, Fla	3,160.00	383.60		3,543.60
St. Johns River, Fla	2,004.34	525.06		2,529.40
San Diego, Cal	6,225.00	3,186.20	27.51	9,438.71
San Francisco, Cal	25,771.07	22,742.12	345.39	48,858.58
San Pedro, Cal	85.00	59.21		144.21
Santa Barbara, Cal	105.00			105.00
Savannah, Ga	10,124.61	6,048.53	124.58	16,297.72
South Atlantic, Ga	4,695.83	2,137.07	39.42	6,872.32
Tampa Bay, Fla	6,847.16	3,601.47	127.22	10,575.85
Washington, N. C	622.00	3.65		625.65
Total	265,971.19	121,976.28	2,972.11	390,919.58

PREVENTING THE SPREAD OF EPIDEMIC DISEASES.

Balance July 1, 1909		$978,013.87
Expenditures:		
Foreign medical service, salaries, and miscellaneous, China, Japan, Italy, Central and South America, and West Indies	$64,186.35	
Panama and Canal Zone, salaries, etc	7,795.00	
Havana, Cuba (including outlying districts), salaries, subsistence, supplies, and miscellaneous	19,793.98	
Mexico, salaries, supplies, etc	6,870.28	
Sanitary inspection in United States, salaries, traveling expenses, and miscellaneous	9,317.69	
Plague suppressive measures, Pacific coast	141,325.69	
Yellow fever, maintenance of detention camps, precaution against outbreak, salaries, medical and hospital supplies, disinfectants, etc	22,668.09	
Texas border inspection, salaries and miscellaneous	5,940.55	
		277,897.63
Balance June 30, 1910		700,116.24
Less outstanding liabilities, estimated		36,700.00

NATIONAL QUARANTINE AND SANITATION.

Balance July 1, 1909		$325,744.08
Expenditures for supplies, improvements, and miscellaneous:		
Mobile, Ala	$9,634.47	
New Orleans, La	2,330.66	
Miscellaneous	130.09	
Purchase of station, New Orleans, La	100,000.00	
Transferred to Supervising Architect, for construction at Galveston, Tex	100,000.00	
		212,095.22
Balance June 30, 1910		113,648.86
Less outstanding liabilities, estimated		5,807.20

SALARIES, OFFICE OF SURGEON GENERAL, PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE, 1910.

Amount of appropriation	$40,980.00
Expenditures	40,599.16
Balance June 30, 1910	380.84

MAINTENANCE OF LEPROSY HOSPITAL, HAWAII, 1910.

Amount of appropriation	45,000.00
Expenditures	35,781.02
Balance June 30, 1910	9,218.98
Less outstanding liabilities, estimated	3,022.33

LEPROSY HOSPITAL, HAWAII, BUILDINGS AND EQUIPMENT.

Balance July 1, 1909	24,566.13
Expended July 1, 1909, to June 30, 1910	5,246.78
Balance June 30, 1910	19,319.35

LEPROSY INVESTIGATION STATION, HAWAII, 1909–10.

Balance July 1, 1909 (act Mar. 4, 1909)	3,109.56
Balance June 30, 1910	3,109.56

APPROPRIATIONS, MARINE HOSPITALS.

Cleveland, Ohio:	
Amount appropriated (act Mar. 4, 1909)	1,750.00
Expended July 1, 1909, to June 30, 1910	1,650.00
Balance June 30, 1910	100.00
Balance July 1, 1909 (act Mar. 4, 1907)	721.95
Expended July 1, 1909, to June 30, 1910	347.00
Balance June 30, 1910	374.95
Wilmington, N. C.:	
Amount appropriated (act Mar. 4, 1909)	350.00
Expended July 1, 1909, to June 30, 1910	342.50
Balance June 30, 1910	7.50
Chicago, Ill.:	
Balance July 1, 1909 (act Mar. 3, 1905)	444.98
Balance June 30, 1910	444.98

Baltimore, Md.:		
Balance July 1, 1909 (act Mar. 4, 1907)		$1.49
Balance June 30, 1910		1.49
Boston, Mass:		
Balance July 1, 1909 (act Mar. 4, 1907)		185.93
Balance June 30, 1910		185.93
Key West, Fla.:		
Balance July 1, 1909 (act Mar. 4, 1907)		50.65
Balance June 30, 1910		50.65
New Orleans, La.:		
Balance July 1, 1909 (act Mar. 4, 1907)		24.30
Balance June 30, 1910		24.30

APPROPRIATIONS, QUARANTINE STATIONS.

Reedy Island:		
Amount appropriated (act Mar. 4, 1909)		23,928.00
Expended July 1, 1909, to June 30, 1910	$408.99	
Outstanding liabilities	20,548.00	
		20,956.99
Balance June 30, 1910		2,971.01
Charleston:		
Amount appropriated (act Mar. 4, 1909)		20,315.00
Balance June 30, 1910		20,315.00
Savannah:		
Amount appropriated (act Mar. 4, 1909)		3,500.00
Balance June 30, 1910		3,500.00
Balance July 1, 1909 (act Mar. 4, 1907)		1.40
Balance June 30, 1910		1.40
San Francisco:		
Amount appropriated (act Mar. 4, 1909)		1,200.00
Expended July 1, 1909, to June 30, 1910		1,195.00
Balance June 30, 1910		5.00
Balance July 1, 1909 (act Mar. 3, 1905)		385.95
Balance June 30, 1910		385.95
Balance July 1, 1909 (act June 30, 1906)		5,894.26
Expended July 1, 1909, to June 30, 1910	$222.69	
Outstanding liabilities	2,470.22	
		2,692.91
Balance June 30, 1910		3,201.35
Balance July 1, 1909 (act May 27, 1908)		180.75
Balance June 30, 1910		180.75
Honolulu:		
Amount appropriated (act Mar. 4, 1909)		11,600.00
Expended July 1, 1909, to June 30, 1910		2,600.00
Balance June 30, 1910		9,000.00
Balance July 1, 1909 (act Mar. 4, 1907)		390.52
Balance June 30, 1910		390.52
San Juan:		
Amount appropriated (act Mar. 4, 1909)		26,200.00
Amount transferred to Supervising Architect		26,200.00

Gulf:		
Balance July 1, 1909 (act Mar. 4, 1907)		$5,008.38
Expended July 1, 1909, to June 30, 1910	$1,267.86	
Outstanding liabilities	2,962.25	
		4,230.11
Balance June 30, 1910		778.27
Port Townsend:		
Balance July 1, 1909 (act Mar. 3, 1905)		940.00
Amount transferred to Supervising Architect		940.00
Pensacola:		
Balance July 1, 1909 (act Mar. 4, 1907)		1,310.69
Expended July 1, 1909, to June 30, 1910		231.70
Balance June 30, 1910		1,078.99
San Diego:		
Balance July 1, 1909 (act Mar. 4, 1907)		5.00
Balance June 30, 1910		5.00
Delaware Breakwater:		
Balance July 1, 1909 (act Mar. 4, 1907)		857.00
Balance June 30, 1910		857.00

STATISTICAL TABLES.

TABLE I.—COMPARATIVE TABLE OF NUMBER OF PATIENTS ANNUALLY TREATED—1868 TO 1910.

Fiscal year.	Number of sick and disabled seamen furnished relief.	Fiscal year.	Number of sick and disabled seamen furnished relief.
Prior to reorganization:		After reorganization—Continued.	
1868	11,535	1889	49,518
1869	11,356	1890	50,671
1870	10,560	1891	52,992
After reorganization:		1892	53,610
1871	14,256	1893	53,317
1872	13,156	1894	52,803
1873	13,529	1895	52,643
1874	14,356	1896	53,804
1875	15,009	1897	54,477
1876	16,808	1898	52,709
1877	15,175	1899	55,489
1878	18,223	1900	56,355
1879	20,922	1901	58,381
1880	24,860	1902	56,310
1881	32,613	1903	58,573
1882	36,184	1904	58,556
1883	40,195	1905	57,013
1884	44,761	1906	54,363
1885	41,714	1907	55,129
1886	43,822	1908	54,301
1887	45,314	1909	53,704
1888	48,203	1910	51,443

TABLE II.—EXHIBIT OF THE OPERATIONS OF THE SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1910.

Port.	Total number of seamen treated.	Patients in hospital July 1, 1909.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1910.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Number of foreign seamen treated.	Days' hospital relief furnished foreign seamen.	Amount expended.
Grand total	**51,451**	**1,073**	**13,205**	**14,278**	**12,759**	**463**	**1,056**	**431,685**	**37,173**	**61,872**	**4,401**	**844**	**10,717**	**$1,163,484.73**
Albany, N. Y	12	2	9	11	10		1	576	1	6				613.78
Apalachicola, Fla	16		10	10	9		1	109	6	6				559.20
Ashland, Wis	92	3	27	30	26	1	3	590	64	65				700.90
Ashtabula, Ohio	152		24	24	24			181	128	198	2			602.92
Astoria, Oreg	207		33	33	31	1	1	357	174	304	52	2	40	1,229.71
Baltimore, Md	1,938	58	526	584	514	10	60	18,475	1,358	2,447	152	2	36	29,819.75
Bangor, Me	79	3	9	12	12			171	67	80	10			775.15
Barnstable, Mass., and subports	16								16	41				45.00
Bath, Me	21								21	22	3			300.80
Beaufort, N. C	42		4	4	4			118	38	57	38			732.00
Beaufort, S. C	35								35	35				36.00
Bellingham, Wash	90		18	18	17	1		212	72	209				617.12
Boothbay Harbor, Me	98	1	17	18	18			326	80	136	5			790.09
Boston, Mass	2,783	52	873	925	818	30	77	28,205	1,858	2,878	199	51	438	40,936.70
Bridgeport, Conn	19		18	18	13	3	2	321	1	2				350.00
Brunswick, Ga	160	1	31	32	30	2		518	128	169				847.24
Buffalo, N. Y	1,609	8	403	411	378	2	31	8,358	1,198	1,753	46			22,609.01
Burlington, Iowa	12		12	12	11		1	171						197.00
Cairo, Ill	457	6	170	176	160	10	6	3,605	281	389				11,578.63
Cambridge, Md	59		34	34	33	1		580	25	27				877.14
Cedar Keys, Fla	41		1	1	1			40	40	54				40.00
Charleston, S. C	505	3	49	52	50	2		492	453	620	41			1,768.14
Chattanooga, Tenn	11	1	3	4	4			62	7	9				387.96
Chicago, Ill	2,041	41	490	531	480	11	40	17,996	1,510	1,890	91			38,444.83
Cincinnati, Ohio	152	1	37	38	36		2	282	114	205	7			2,800.82
Cleveland, Ohio	1,612	25	372	397	355	13	29	11,193	1,215	2,255	28			21,282.89
Corpus Christi, Tex	10		4	4	3		1	45	6	12	7			425.25
Crisfield, Md	136								136	174				317.00
Darien, Ga,														
Delaware Breakwater, Del	128		2	2	1		1	133	126	157	49	2	99	2.95
Detroit, Mich	1,352	18	312	330	297	9	24	8,296	1,022	3,502	29			23,646.43
Dubuque, Iowa	7		3	3	3			41	4	4	7			376.88
Duluth, Minn	432	5	97	102	92	2	8	1,461	332	384	18			1,825.54
Eastport, Me														34.10
Edenton, N. C	58		1	1	1			6	57	77				89.00
Edgartown, Mass	2								2	2				2.50

TABLE II.—EXHIBIT OF THE OPERATIONS OF THE SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1910—Continued.

Port.	Total number of seamen treated.	Patients in hospital July 1, 1909.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1910.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Number of foreign seamen treated.	Days' hospital relief furnished foreign seamen.	Amount expended.
Elizabeth City, N. C.	34								34	42	121			420.79
Ellsworth, Me.	17								17	64	9			300.00
El Paso, Tex.														77.50
Erie, Pa.	147	3	35	38	35	3		1,112	109	238	9			1,924.76
Escanaba, Mich.	82		10	10	8	1	1	96	72	72				397.00
Eureka, Cal.	68		19	19	18		1	191	49	67	10			749.79
Evansville, Ind.	516	5	135	140	133	1	6	3,649	376	641	2			12,693.97
Fernandina, Fla.	115		12	12	12			134	103	144				501.00
Fort Stanton, N. Mex.	360	211	149	360	150	56	154	70,777						94,115.42
Gallipolis, Ohio	159	4	71	75	70	3	2	1,644	84	243				2,333.00
Galveston, Tex.	512	4	122	126	112	5	9	2,585	386	610	108			7,069.18
Georgetown, S. C.	299	1	46	47	46		1	521	252	333	1			1,147.00
Gloucester, Mass.	289		29	29	25	3	1	480	260	368	38			1,284.98
Government Hospital for the Insane	47	39	8	47	2		45	15,834						10,178.99
Grand Haven, Mich.	41		21	21	19		2	286	20	37	70			779.68
Green Bay, Wis.	55	2	10	12	11		1	186	43	54	44			525.90
Hartford, Conn.	5	1	4	5	4		1	119						120.00
Honolulu, Hawaii	668	10	178	188	172	4	12	5,692	480	868	49	5	33	11,997.92
Hoquiam, Wash.	81	4	43	47	44	2	1	803	34	39	6			1,647.58
Houghton, Mich.	3		3	3	3			52						300.00
Hygienic Laboratory														96,708.92
Immigration Service														145,891.57
Irvington, Va.	75		3	3	2		1	78	72	101				409.50
Jacksonville, Fla.	386	2	104	106	103	2	1	1,538	280	287	8	2	23	3,020.28
Juneau, Alaska	106		35	35	35			693	71	156	34			2,410.00
Kansas City, Mo.	24		6	6	4		2	121	18	49				466.98
Ketchikan, Alaska	89		15	15	15			187	74	121		1	4	1,434.45
Key West, Fla.	331	8	90	98	81	8	9	3,945	233	315	34	4	59	13,041.85
La Crosse, Wis.	72	3	7	10	10			132	62	139				710.40
Life Saving Service, examinations by officers specially detailed											407			
Little Rock, Ark.	40		14	14	14			194	26	34	1			443.00
Los Angeles, Cal.	572	9	178	187	176	2	9	3,406	385	778	2	2	24	11,247.99
Louisville, Ky.	871	17	217	234	205	10	19	8,458	637	896	17			17,062.39
Ludington, Mich.	90		11	11	10	1		156	79	114	67			553.91
Machias, Me.	17		4	4	4			189	13	21	76			608.50
Manistee, Mich.	92		9	9	9			128	83	119	38			528.66

Manitowoc, Wis	185	3	54	57	52		5	1,767	128	171	14			2,187.55
Marquette, Mich	107	1	18	19	14	2	3	518	88	91	13			878.00
Memphis, Tenn	1,846	12	594	606	579	17	10	7,952	1,240	1,622	16			18,062.43
Menominee, Mich	45		4	4	4			87	41	79	1			406.34
Milwaukee, Wis	1,112	14	263	277	256	7	14	5,388	835	1,257	98			11,197.00
Miscellaneous														1,545.48
Mobile, Ala	1,481	17	458	475	440	12	23	7,382	1,006	1,424	36	119	1,263	16,321.28
Nashville, Tenn	71		8	8	8			108	63	125	7			455.80
Natchez, Miss	86		12	12	12			161	74	193				680.60
New Bedford, Mass	66		6	6	6			130	60	102	38			477.65
Newbern, N. C	300	2	37	39	38		1	467	261	542	6			1,201.97
New Haven, Conn	38		15	15	13	1	1	283	23	32	14			716.41
New London, Conn	52	1	11	12	9	2	1	222	40	41	31			954.30
New Orleans, La	1,580	40	433	473	417	20	36	13,640	1,107	1,664	41	92	1,163	28,701.30
Newport, Ark	48		4	4	4			26	44	71				403.00
Newport, R. I	37	1	24	25	23		2	432	12	15	25			964.03
Newport News, Va	129								129	132	19			376.32
New York, N. Y	3,223	105	1,110	1,215	1,056	39	120	38,896	2,008	3,301	397	423	5,803	52,617.20
Nome, Alaska	26	3	9	12	11		1	295	14	17				2,045.75
Norfolk, Va	2,710	30	633	663	621	17	25	10,586	2,047	2,563	165			16,780.38
North Bend, Oreg	78		33	33	32	1		702	45	63	7			1,384.75
Ogdensburg, N. Y	73	3	14	17	15		2	562	56	145				1,015.43
Oswego, N. Y	21		5	5	5			63	16	22				148.60
Paducah, Ky	95		4	4	4			55	91	233				469.68
Pensacola, Fla	85		8	8	7	1		95	77	202	11			636.70
Philadelphia, Pa	1,815	10	346	356	338	8	10	5,325	1,459	2,200	224			13,358.37
Pittsburg, Pa	670	12	125	137	124	4	9	2,127	533	882	27			9,057.57
Ponce, P. R	33		7	7	7			190	26	78		1	20	237.50
Port Arthur, Tex	60	1	14	15	15			242	45	51				784.60
Port Huron, Mich	149	1	5	6	6			14	143	554	27			321.00
Portland, Me	658	16	246	262	235	16	11	7,152	396	525	97	21	315	21,411.63
Portland, Oreg	605	6	154	160	152	3	5	2,830	445	652	40			8,524.27
Portsmouth, N. H	7		3	3	3			28	4	5	36			229.00
Port Tampa, Fla	197	2	74	76	73	1	2	1,861	121	254	2			2,696.86
Port Townsend, Wash	546	42	375	417	366	17	34	16,301	129	196	19	25	344	18,697.19
Providence, R. I	555	2	88	90	81	4	5	1,152	465	1,006	20			2,745.80
Provincetown, Mass	62								62	89	63			252.80
Purveying depot														55,919.14
Railroad transportation, freight charges, etc														9,462.50
Revenue-cutter vessels, cruises of	2,060								2,060	5,026				11,307.17
Richmond, Va	60		13	13	13			262	47	124				704.62
Rockland, Me	240		4	4	3	1		36	236	595	20			551.15
Sag Harbor, N. Y	1								1	2				2.00
Saginaw, Mich	91		23	23	20		3	476	68	85	1			794.72
Salem, Mass	24		2	2	2			5	22	22				50.50
San Diego, Cal	105	1	17	18	18			244	87	132	19	3	5	5,170.16
Sandusky, Ohio	84	1	5	6	5	1		86	78	134	19			360.60
San Francisco, Cal	2,681	115	1,186	1,301	1,193	34	74	42,400	1,380	2,286	310	40	592	55,703.98
San Juan, P. R	268	6	103	109	97	3	9	2,168	159	216	39			2,251.55
St. Louis, Mo	775	25	250	275	232	15	28	10,130	500	693	43			18,872.76
St. Paul, Minn	18		10	10	7	3		167	8	15				501.65

Table II.—Exhibit of the Operations of the Service during the Fiscal Year ended June 30, 1910—Continued.

Port.	Total number of seamen treated.	Patients in hospital July 1, 1909.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1910.	Number of days' relief in hospital.	Number of seamen furnished office relief.	Number of times office relief was furnished.	Number of persons examined physically, including pilots.	Number of foreign seamen treated.	Days' hospital relief furnished foreign seamen.	Amount expended.
Sault Ste. Marie, Mich.	252	7	110	117	108	1	8	1,430	135	156	34			$2,826.53
Savannah, Ga.	1,049	11	278	289	271	7	11	6,765	760	996	69	3	26	14,822.19
Seattle, Wash.	1,751	8	254	262	243	11	8	3,579	1,489	2,593	323	13	133	8,022.88
Sheboygan, Wis.	15		7	7	7			111	8	9	15			441.40
Sitka, Alaska.														
Solomons, Md.	346		5	5	5			47	341	407	3			569.04
Special duty														12,190.17
Superior, Wis.	269	4	83	87	80	2	5	1,473	182	226				2,236.62
Tacoma, Wash.	114		37	37	37			535	77	119	1	10	66	1,478.84
Tappahannock, Va.														
Toledo, Ohio.	300	2	96	98	96	2		1,383	202	607	5			1,725.00
Traveling expenses.														12,305.68
Valdez, Alaska.	253		9	9	8		1	93	244	432				1,293.41
Vicksburg, Miss.	209	2	83	85	81	2	2	966	124	261				2,035.85
Vineyard Haven, Mass.	203	11	91	102	92	4	6	2,983	101	104	9	2	49	10,609.22
Washington, D. C. (bureau)														30,646.77
Do.	110		25	25	18	3	4	756	85	110	5			1,996.75
Washington, N. C.	159		14	14	13		1	136	145	237	4			156.40
Wheeling, W. Va.	22	1	20	21	20		1	126	1	1				463.56
Wilmington, N. C.	361	4	64	68	62	2	4	1,546	293	429	42	2	16	10,302.09
Cape Charles quarantine	21		6	6	6			30	15	15		6	30	
Cape Fear quarantine	61								61	118	10			
Gulf quarantine.	11		11	11	11			126			1	11	126	
Reedy Island quarantine.	2		2	2	1	1		12						
San Francisco quarantine	9		9	9	4		5	157						
Tampa Bay quarantine	19		15	15	15			102	4	4				
Pensacola quarantine	2		2	2	2			10				2	10	

TABLE III.—SUMMARY OF PHYSICAL EXAMINATIONS MADE BY OFFICERS OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1910, EXCLUSIVE OF ALIEN IMMIGRANTS.

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Revenue-Cutter Service.	Life-Saving Service.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Isthmian Canal Commission.	Philippine Islands.
Total number examined	4,571	919	133	1,247	1,789	199	44	5	95	92	7	41
Number passed	4,187	878	114	1,059	1,710	163	40	1	92	83	7	40
Number rejected	384	41	19	188	79	36	4	4	3	9	....	1
Causes of rejection (disease, disability, etc.).												
Albuminuria	11	....	1	8	....	....	....	1	....	1	....	....
Alcoholism	5	....	....	5	....	....	....	....	....	....	....	....
Asthma	1	....	....	1	....	....	....	....	....	....	....	....
Bronchitis	7	....	....	4	2	1	....	....	....	....	....	....
Catarrh	2	....	1	1	....	....	....	....	....	....	....	....
Color blindness	37	19	....	12	1	3	1	....	....	1	....	....
Contusion of hand	1	....	....	....	1	....	....	....	....	....	....	....
Curvature of spine	3	....	....	3	....	....	....	....	....	....	....	....
Cyst epididymis	1	....	....	1	....	....	....	....	....	....	....	....
Debility	10	....	1	....	7	....	....	2	....	....	....	....
Defective hearing	2	....	....	....	2	....	....	....	....	....	....	....
Defective teeth	11	....	....	6	2	3	....	....	....	....	....	....
Defective vision	67	22	4	30	8	3	....	....	....	....	....	....
Dilatation, lymphatics	1	....	....	1	....	....	....	....	....	....	....	....
Deformity, chest	4	....	....	4	....	....	....	....	....	....	....	....
Deformity, leg	1	....	....	....	....	....	1	....	....	....	....	....
Eczema	1	....	....	1	....	....	....	....	....	....	....	....
Enlarged inguinal ring	1	....	....	....	....	1	....	....	....	....	....	....
Enlarged testicle	1	....	....	1	....	....	....	....	....	....	....	....
Flat foot	4	....	....	3	....	1	....	....	....	....	....	....
General adenitis	1	....	....	1	....	....	....	....	....	....	....	....
Gonorrhea	11	....	....	9	....	2	....	....	....	....	....	....
Heart:												
Abnormal action of	8	....	....	5	1	1	....	....	....	1	....	....
Aortic regurgitation	2	....	....	2	....	....	....	....	....	....	....	....
Mitral regurgitation	5	....	....	3	1	....	....	....	....	1	....	....
Valvular disease of	15	....	1	7	6	1	....	....	....	....	....	....
Weakness of	1	....	....	1	....	....	....	....	....	....	....	....
Hernia	15	....	2	5	6	2	....	....	....	....	....	....
Impairment of lung	1	....	....	1	....	....	....	....	....	....	....	....
Inflamation, knee joint	4	....	....	2	2	....	....	....	....	....	....	....
Inflamation, hip joint	1	....	....	....	1	....	....	....	....	....	....	....
Inflamation, lymph glands, groin	3	....	....	2	....	1	....	....	....	....	....	....
Inflamation, nose	1	....	1	....	....	....	....	....	....	....	....	....
Influenza	1	....	....	....	....	....	1	....	....	....	....	....
Liver, cyst of	1	....	1	....	....	....	....	....	....	....	....	....
Malarial fever	1	....	1	....	....	....	....	....	....	....	....	....
Malformation of testicle	1	....	....	1	....	....	....	....	....	....	....	....
Malformation of eye	1	....	....	1	....	....	....	....	....	....	....	....
Myopia	1	....	....	1	....	....	....	....	....	....	....	....
Nephritis	1	....	....	1	....	....	....	....	....	....	....	....
Nervous weakness	6	....	....	....	6	....	....	....	....	....	....	....
Piles	9	....	1	4	1	2	1	....	....	....	....	....
Pleurisy	2	....	....	1	1	....	....	....	....	....	....	....
Pneumonia	1	....	....	....	1	....	....	....	....	....	....	....
Poor physique	16	....	....	12	....	3	....	....	....	1	....	....
Recent insanity	1	....	....	....	....	....	....	....	....	....	....	1
Rheumatism	3	....	....	....	3	....	....	....	....	....	....	....
Scabies	4	....	....	3	....	1	....	....	....	....	....	....
Sclerosis of brain	1	....	1	....	....	....	....	....	....	....	....	....
Soft chancre	2	....	....	2	....	....	....	....	....	....	....	....
Stricture of urethra	2	....	....	2	....	....	....	....	....	....	....	....
Syphilis	8	....	....	6	....	....	....	1	1	....	....	....
Tachycardia	2	....	....	2	....	....	....	....	....	....	....	....
Tonsilitis	3	....	....	3	....	....	....	....	....	....	....	....
Trachoma	5	....	....	....	....	3	....	....	1	1	....	....
Tracheitis, catarrhal	1	....	1	....	....	....	....	....	....	....	....	....
Tuberculosis	11	....	2	2	2	2	....	....	1	2	....	....
Tumor, skin of chest	1	....	....	1	....	....	....	....	....	....	....	....
Ulcer of penis	1	....	....	1	....	....	....	....	....	....	....	....
Underdeveloped	4	....	....	4	....	....	....	....	....	....	....	....

TABLE III.—SUMMARY OF PHYSICAL EXAMINATIONS MADE BY OFFICERS OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE DURING THE FISCAL YEAR ENDED JUNE 30, 1910, EXCLUSIVE OF ALIEN IMMIGRANTS—Continued.

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Revenue-Cutter Service.	Life-Saving Service.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Isthmian Canal Commission.	Philippine Islands.
Cause of rejection (disease, disability, etc.)—Continued.												
Underheight	4			1	2							
Underweight	17			3	11	3						
Varicocele	16			12	1	3						
Varicose veins	7			5	2							
Varix	2			2								
Declined examination	1		1									

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Total cases	**1,073**	**13,205**	**7,318**	**4,963**	**478**	**463**	**1,056**	**37.173**	**51.451**
General diseases	**516**	**5,021**	**2,553**	**2,103**	**207**	**227**	**447**	**13.604**	**19.141**
Smallpox		41	30	1	1	5	4	6	47
Cowpox		3	3					8	11
Chicken pox	1	5	6					9	15
Measles		54	49	2	2		1	11	65
Rubella		2	2					2	4
Scarlet fever	1	5	3	2			1	3	9
Typhus fever		2	2					1	3
Relapsing fever								1	1
Dengue								1	1
Influenza	5	138	102	31	3	2	5	900	1,043
Whooping cough								1	1
Mumps		32	26	5			1	20	52
Diphtheria		16	13	1	1		1	3	19
Cerebrospinal fever		3				3			3
Simple continued fever		21	9	7	1	2	2	4	25
Enteric fever	40	307	225	41	7	23	51	25	372
Choleraic diarrhea		11	9	1		1		11	22
Epidemic diarrhea								19	19
Dysentery	4	51	32	17	3	1	2	59	114
Beriberi	1	6	4	2		1			7
Malarial fever:									
Intermittent	22	642	497	137	5	5	20	1,406	2,070
Remittent	7	206	176	30	2	5		70	283
Phagedæna		3	1	1	1				3
Erysipelas	1	56	48	5	2	1	1	19	76
Pyæmia		2	2						2
Septicæmia		1	1					6	7
Tetanus								1	1
Tubercle	252	564	61	341	89	138	187	139	955
Leprosy		1					1	2	3
Syphilis:									
Primary	1	46	7	38			2	130	177
Secondary	45	657	51	583	24	2	42	3,065	3,767
Tertiary	2	14	3	12			1	48	64
Gonorrhea	58	772	386	371	24		49	3,753	4,583

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Actinomycosis		2	2						2
Diseases dependent on animal parasites	7	90	52	38	2	3	2	422	519
Diseases dependent on vegetable parasites		5	2	2			1	45	50
Effects of animal poisons		3	3					9	12
Decayed and poisonous food		9	9					3	12
Effects of vegetable poisons	1	10	7	3		1		27	38
Effects of inorganic poisons		7	6	1				11	18
Effects of the presence of foreign bodies	1	4	3	2				17	22
Effects of mechanical injuries		2	1	1				4	6
Effects of heat		5	3	1			1	5	10
Effects of cold		4	4						4
Effects of chemical agents		2	1	1				5	7
Effects of excessive exertions and strain		4	3			1		4	8
Scurvy		1		1				6	7
Alcoholism	2	199	150	39	3	2	7	169	370
Rheumatic fever	6	174	123	42	4	1	10	35	215
Rheumatism	35	594	346	234	10	2	37	2,436	3,065
Gout		1	1					5	6
Osteoarthritis	6	32	6	30			2	1	39
Cyst								3	3
Mucous		2	2						2
Sebaceous		11	8	2	1			34	45
Pellagra								1	1
New growth, nonmalignant	3	47	33	6	5	3	3	124	174
New growth, malignant	7	47	4	18	7	19	6	16	70
Leucocythæmia		3		2		1			3
Rickets								1	1
Anemia		8	4	3	1			32	40
Purpura		3	1	1		1		5	8
Hodgkin's disease								1	1
Diabetes mellitus	1	22		14	4	1	4	17	40
Diabetes insipidus		2		2				7	9
Hæmophilia		2	1	1				1	3
Congenital malformations	1	17	13	2	2		1	10	28
Debility	6	46	17	28	3	2	2	425	477
Senility		2		1		1			2
Local diseases	**423**	**5,690**	**3,175**	**2,044**	**230**	**202**	**462**	**18,116**	**24,229**
Diseases of the nervous system	123	354	77	203	43	17	137	1,029	1,506
Of the nerves—									
Inflammation—									
Neuritis	5	32	17	18	2			74	111
Multiple neuritis	2	5	3	4					7
Of the spinal cord and membranes—Cord:									
Inflammation								1	1
Diffuse	1						1		1
Local		4	1	2		1			4
Degeneration—									
Insular		5		2			3	1	6
Of anterior cornua	1	4		2			3		5
Of lateral columns	4	4		2	2	2	2	2	10
Of posterior columns	19	31		23	8	3	16	21	71
Of lateral and posterior columns	3			3					3
Locomotor ataxia		2					2	8	10
Acute ascending paralysis								1	1
Of the brain and its membranes—Membranes:									
Inflammation								1	1
Of dura mater		4	3	1					4
Hemorrhage		3	1	2				3	6
Of the brain and its membranes—Brain:									
Abscess		1				1			1
Sclerosis								6	6
Softening	2				1		1		2
Hemorrhage	2	6		4		1	3	4	12
Bulbar paralysis		1	1						1

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
Diseases of the nervous system—Continued.									
Functional nervous disorders with other diseases of undetermined nature—									
Apoplexy		6		5		1		2	8
Paralysis—									
Paraplegia	4	4	1	3			4	3	11
Hemiplegia	19	42		33	1	4	23	25	86
Local paralysis	1	7		5	1		2	10	18
Incomplete paralysis	8	8		11	2	2	1	4	20
Paralysis agitans		2			2			1	3
Spasm		1	1					9	10
Torticollis								12	12
Facial spasm								2	2
Hiccough		2	2					3	5
Epilepsy	1	15	1	9	4	1	1	39	55
Vertigo		4	1	3				21	25
Headache		8	4	4				159	167
Hyperæsthesia								3	3
Anæsthesia								2	2
Neuralgia	3	69	34	30	1		7	304	376
Hysteria		3		3					3
Nervous weakness	2	37	6	27	5		1	154	193
Aphasia		1		1				1	2
Mental diseases—									
Mania	10	3					13		13
Melancholia	4	5	1		3		5	5	14
Dementia	28	15		3	6		34	2	45
General paralysis of the insane	1	10		1	1	1	8	142	153
Delusional insanity	3	10		2	4		7	4	17
DISEASES OF THE EYE	10	106	44	52	10		10	516	632
Conjunctivitis:									
Catarrhal—									
Acute	1	23	12	12				329	353
Chronic		9	4	3	2			6	15
Purulent	1	3	1	3				1	5
Ecchymosis of conjunctiva								1	1
Œdema of conjunctiva								5	5
Degeneration of conjunctiva								4	4
Keratitis		4		2	2			14	18
Ulceration of cornea	3	15	9	8			1	15	33
Gangrene of eye		1	1						1
Opacity of cornea								2	2
Acquired deformities of cornea		2		1	1			1	3
Scleritis		1	1					2	3
Iritis	1	27	8	15			5	12	40
Congestion of choroid and ciliary body								3	3
Choroiditis								4	4
Glaucoma	1	1	1	1					2
Atrophy and degeneration of optic nerve or papilla		1		1				5	6
Retinitis		2		2				3	5
Lenticular cataract	2	2					4	6	10
Capsular cataract								1	1
Dislocation lens traumatic		1			1				1
Shrunken eyeball		1	1						1
Amblyopia								4	4
Ametropia		2		1	1			9	11
Inflamation lachrymal gland								1	1
Asthenopia		1			1			4	5
Squint		1	1						1
Stricture and obliteration of puncta and canaliculi		3	3						3
Abscess lachrymal sac								2	2
Obstruction of nasal duct		1			1			3	4
Fistula lachrymal sac		1		1					1
Blepharitis marginalis		1			1			23	24
Sty		1	1					31	32
Abscess of eyelid		1	1					11	12

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE EYE—Cont'd.									
Ecchymosis of eyelid								6	6
Chronic dacryo-cystitis	1	1		2				1	3
Ptosis								4	4
Trichiesis								1	1
Ectropion								2	2
DISEASES OF THE EAR		66	26	35	3		2	271	337
Inflammation of the external meatus—									
Acute		4	2	2				32	36
Abscess		2	2					5	7
Accumulation in external meatus of wax or epidermis		2	1	1				75	77
Inflammation of the middle ear—									
Nonsuppurative		8	2	4	1		1	40	48
Suppurative		45	16	26	2		1	92	137
Ulceration of membrana tympani								2	2
Perforation of membrana tympani		2	2					7	9
Obstruction of Eustachian tube								2	2
Tinnitus		2	1	1				6	8
Deafness		1		1				10	11
DISEASES OF THE NOSE	1	29	15	11	2		2	492	522
Inflammation of soft parts	1	12	5	8				419	432
Diseases of septum—									
Abscess		2	1	1				1	3
Deviations		4	3		1			4	8
Epistaxis		2	2					6	8
Inflammation of the accessory sinuses		6	3	1			2	19	25
Inflammation of the nasopharynx		3	1	1	1			43	46
DISEASES OF THE CIRCULATORY SYSTEM	50	372	46	240	32	62	42	277	699
Pericarditis		2		2				7	9
Endocarditis		1				1		1	2
Valvular disease of heart									
Aortic	3	89		82	2	4	4	18	110
Mitral	25	105	2	63	9	36	20	29	159
Aortic and mitral		26		14	1	10	1	14	40
Inflammation	7	11	1	14	1	1	1	13	31
Degeneration of heart		1		1					1
Fatty	3	6		3	3	3		9	18
Hypertrophy of heart		3		2		1		18	21
Dilatation of heart	2	7		8			1	6	15
Angina pectoris		2		2				2	4
Syncope		1	1					1	2
Disordered action of the heart—									
Abnormal slowness	1			1				1	2
Irregularity	1	8	2	6			1	22	31
Arteritis		6		4	2			10	16
Degeneration of arteries—									
Arteriocapillary fibrosis	1	7		3	3		2	3	11
Aneurysm of arteries	3	18	1	6	5	5	4	7	28
Obstruction of arteries—									
Thrombosis		2		1			1	2	4
Embolism								2	2
Phlebitis	1	8	5	2		1	1	8	17
Varix	3	69	34	26	6		6	104	176
DISEASES OF THE RESPIRATORY SYSTEM	30	725	388	240	24	63	40	2,577	3,332
Hay fever		1	1					9	10
Edema of larynx		1	1						1
Inflammation of mucous membrane of larynx—									
Catarrhal, acute		22	14	7		1		129	151
Catarrhal, chronic		3		3				7	10
Suppurative		1	1						1
Tracheitis, catarrhal		9	6	3				111	120

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE RESPIRATORY SYSTEM—Continued.									
Bronchitis—									
Catarrhal, acute	2	267	176	77	8	2	6	1,816	2,085
Catarrhal, chronic	6	85	13	52	7	4	15	261	352
Ulceration		1		1					1
Spasmodic asthma	5	37	8	26	2	4	2	66	108
Congestion of lung		3	3					40	43
Hemorrhage of lung		1		1					1
Hæmoptysis	1	2	1	2				2	5
Edema of lung		1				1		1	2
Pneumonia	7	143	82	22	3	37	6	14	164
Broncho-pneumonia	1	17	10	4		3	1		18
Abscess of lung		3		1		2		1	4
Chronic interstitial inflammation		2		1			1		2
Phthisis—									
Acute	1	2	1	2				4	7
Chronic		5			3	2		4	9
Tubercular		5		2		2	1	1	6
Pleurisy		1				1		1	2
Acute	7	92	65	26	1	3	4	96	195
Chronic		14	3	8		1	2	9	23
Empyema		5	3	1			1	1	6
Hydrothorax								3	3
Adhesions of pleura		2		1		1		1	3
Emphysema		1					1	1	2
DISEASES OF THE DIGESTIVE SYSTEM	69	1,504	1,086	346	47	33	61	5,906	7,479
Inflammation of the lips								7	7
Ulceration of the lips								9	9
Fissure of the lips								2	2
Inflammation of the mouth		3	2	1				39	42
Ulceration of the mouth								18	18
Inflammation of the dental pulp								3	3
Suppuration of the dental pulp		1	1					7	8
Caries of dentine and cementum		1	1					90	91
Necrosis of cementum								3	3
Inflammation of dental periosteum								4	4
Abscess of dental periosteum		9	6	1	1		1	27	36
Inflammation of gums and alveoli								15	15
Suppuration of aveloli		2	2					11	13
Ulceration of gums and alveoli		2	1	1				8	10
Caries of the alveoli		1		1					1
Toothache		1	1					82	83
Hypertrophy gums								1	1
Atrophy alveolus								1	1
Inflammation of the tongue								2	2
Ulceration of the tongue		1		1				5	6
Sore throat		24	18	6				188	212
Ulceration fauces and uvula		1		1					1
Inflammation of tonsils—									
Follicular	1	197	164	28	1	1	4	406	604
Suppuration		23	18	5				19	42
Hypertrophy of tonsils		7	2	3	2			7	14
Elongated uvula								12	12
Salivary fistula		1		1					1
Salivation								1	1
Inflammation of the pharynx—									
Catarrhal	1	19	18	2				183	203
Granular		1		1					1
Follicular								4	4
Post-pharyngeal abscess		1	1						1
Ulceration of pharynx								2	2
Stricture of œsophagus								1	1
Inflammation of the stomach—									
Catarrhal	8	150	84	61	5	3	5	487	645
Displacement of the stomach								1	1
Ulceration of the stomach—									
Superficial		13	4	8			1	13	26
Perforating		2		1		1		1	3

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE DIGESTIVE SYSTEM—Continued.									
Hemorrhage of the stomach		1	1					2	2
Atrophy of the stomach								2	2
Dilatation of the stomach	1	1		1			1	1	3
Indigestion	4	134	98	30	3	1	6	1,292	1,430
Pyrosis		1	1					2	3
Nausea								3	3
Vomiting								7	7
Gastralgia		3	2		1			7	10
Heartburn								3	3
Loss of appetitie		2	1	1				53	55
Inflammation of the intestines—									
Enteritis	2	46	36	9		1	2	68	116
Typhlitis	9	115	88	20	3	4	9	26	150
Colitis	2	6	7		1			2	10
Catarrhal		28	22	3	2	1		31	59
Ulceration of the intestines		1				1			1
Hemorrhage of the intestines		3	2				1	3	6
Fecal accumulation		9	8	1				4	13
Hernia	15	212	177	24	15	2	9	441	668
Stricture of the rectum	2	1		2	1			3	6
Obstruction of the intestines		8	6			2		1	9
Intestinal dyspepsia	2	7	3	5	1			31	40
Constipation		40	34	4			2	1,143	1,183
Colic	1	20	19	2				32	53
Diarrhea	2	98	79	16	1	1	3	483	583
Enteralgia								4	4
Inflammation of the rectum		2	1	1				2	4
Periproctitis		4		3			1	2	6
Abscess	2	23	13	11			1	13	38
Ulceration of the rectum		1				1		2	3
Fissure of the anus	1	6	4	2	1			11	18
Fistula in ano	4	41	27	15	1		2	30	75
Prolapse of the rectum								1	1
Piles—									
Internal	3	33	24	10	2			137	173
External	1	43	23	20	1			108	152
Mixed		20	14	2	1	1	2	8	28
Pruritus ani		1		1				12	13
Inflammation of the liver—									
Acute	3	7	6	2	1	1		20	30
Acute suppuration		2	1	1				1	3
Acute abscess		2				2			2
Chronic		27	4	12	1	6	4	9	36
Hyperæmia of the liver	1	27	23	4			1	153	181
Atrophy of the liver		1				1		11	12
Hypertrophy of the liver								2	2
Jaundice	1	17	9	9				32	50
Inflammation of hepatic ducts and gall bladder	2	35	24	8	1	1	3	22	59
Calculi		6		5		1		9	15
Accumulation of bile								12	12
Biliary colic		4	4					4	8
Perforation—biliary fistula		1					1	1	2
Inflammation of the peritoneum	1	4	2		1	1	1		5
Dropsy		1					1	1	2
DISEASES OF THE LYMPHATIC SYSTEM	24	331	206	115	9		25	382	737
Splenitis		1		1				3	4
Atrophy of spleen								1	1
Hypertrophy of spleen		1		1				1	2
Inflammation of lymph glands		3	1				2	14	17
Suppuration	23	300	187	107	8		21	324	647
Hypertrophy of lymph glands		2	2					19	21
Inflammation of lymphatics—									
Suppuration	1	23	16	5	1		2	17	41
Elephantiasis		1		1				3	4
DISEASES OF THE THYROID BODY		2		2				7	9
Goiter		2		2				7	9
DISEASES OF THE URINARY SYSTEM	17	190	47	109	12	19	20	448	655
Acute nephritis	4	35	11	19	2	4	3	17	56
Bright's disease—									
Chronic nephritis	7	61	2	45	4	11	6	87	155
Granular kidney	2	11		9		2	2	9	22

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE URINARY SYSTEM—Continued.									
Abscess—									
Of kidney	1	1		1			1		2
Pyonephrosis		1	1						1
Pyelitis		4	3				1	3	7
Congestion of kidney		1	1						1
Movable kidney								1	1
Calculus in kidney		1		1				8	9
Calculus in ureter		5	1	2			2	2	7
Nephralgia		1	1					1	2
Hæmaturia		4	1	1	2			5	9
Chyluria		1		1					1
Albuminuria		1	1					5	6
Lithuria		1	1					1	2
Phosphaturia								3	3
Inflammation of bladder—									
Acute	3	35	18	19			1	169	207
Subacute		7	1	5			1	25	32
Chronic		8		4	1	2	1	56	64
Calculus of bladder		4	1	1	2			2	6
Recto-vesical fistula		1					1		1
Irritability of bladder		1	1					23	24
Retention of urine		3	2				1	4	7
Incontinence of urine		3	1	1	1			27	30
DISEASES OF THE GENERATIVE SYSTEM	41	930	522	368	21	4	56	1,808	2,779
Urethritis		2	2					79	81
Gleet								20	20
Abscess of the urethra		2	2					1	3
Ulcer of the urethra		1	1						1
Hemorrhage of the urethra		2	1	1				3	5
Stricture of urethra—									
Organic	6	136	45	91	2		4	237	379
Traumatic	1			1				1	2
Spasmodic	1	2	2	1				6	9
Urethral fever		1	1						1
Urethral fistula	3	6	6	3				6	15
Inflammation of the prostate—									
Acute		3		2			1	7	10
Chronic		1		1				8	9
Prostatic abscess								1	1
Prostatarrhea								1	1
Atrophy of prostate								1	1
Hypertrophy of the prostate		10	1	5		3	1	23	33
Posthitis								4	4
Edema of the prepuce								1	1
Phimosis	2	47	39	7		1	2	34	83
Paraphimosis		10	7	2			1	7	17
Inflammation of the penis								22	22
Of the glans		6	2	4				1	7
Abscess of penis		2	1	1				6	8
Ulcer of penis	5	137	53	80	5		4	151	293
Edema of penis		4	3	1				2	6
Soft chancre	15	323	189	110	5		34	828	1,166
Inflammation of the scrotum		2	2					1	3
Abcess of the scrotum		2		1			1	3	5
Pruritus of the scrotum								2	2
Inflammation of the spermatic cord		1		1				2	3
Hydrocele of the spermatic cord		3		2			1	5	8
Varicocele	2	37	29	5	5			90	129
Hydrocele of tunica vaginalis	2	32	29	4	1			44	78
Inflammation of the testicle—									
Acute orchitis	1	96	68	24	1		4	129	226
Chronic orchitis		10	2	7	1			11	21
Epididymitis	1	38	27	9			3	19	58
Abscess of testicle		5	3	2				3	8
Spermatorrhea		1		1				15	16
Impotence		1		1				17	18
Inflammation of the ovary	1		1						1

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE GENERATIVE SYSTEM—Continued.									
Inflammation of the fallopian tube	1	1	2					1	3
Inflammation of the uterus		2	1		1			1	3
Hypertrophy of the uterus		2	1	1					2
Displacements and distortions of the uterus								1	1
Inflammation of the vagina								1	1
Dysmenorrhea								2	2
Menorrhagia		1	1					6	7
Metrorrhagia								2	2
Leucorrhea								2	2
Cramp and spurious labor pains								1	1
Lacerated perineum		1	1						1
DISEASES OF THE ORGANS OF LOCOMOTION	19	312	199	96	13	3	20	1,487	1,818
Inflammation of the bones—									
Osteitis		12	5	4		1	2	6	18
Periostitis	2	11	5	7	1			10	23
Caries		2		1		1		1	3
Millities ossium								1	1
Necrosis	3	30	33					13	46
Atrophy of femur		1		1					1
Inflammation of joints—									
Acute synovitis	8	32	22	14	2		2	63	103
Chronic synovitis	1	17	2	15			1	4	22
Suppuration		1					1		1
Ankylosis	1			1				4	5
Dislocation of articular cartilage		4	3	1				3	7
Relaxation of ligaments								2	2
Dislocation of hip joint		2	2						2
Inflammation of spine	1	3				1	3	2	6
Caries of the spine	1	2		1			2	3	6
Psoas, lumbar, and other abscesses	1	2		3				1	4
Inflammation of muscles		2		2				5	7
Suppuration of muscles		3	1	2				6	9
Atrophy of muscles		7		5			2	1	8
Idiopathic muscular atrophy		1			1			1	2
Myalgia—									
Lumbago		126	93	26	4		3	1,233	1,359
Stiff neck								7	7
Contracture of fasciæ		1		1				1	2
Inflammation of tendons		1			1			5	6
Contraction of tendons		4	4					3	7
Inflammation of sheaths of tendons		6	3	3				28	34
Thecal abscess		3	3					3	6
Ganglion		1		1				3	4
Inflammation of bursæ—									
Acute		11	7	2	1		1	43	54
Chronic		8	4	2	1		1	1	9
Abscess of bursæ	1	1	2					2	4
Bunion		2	1		1			2	4
Bursal cyst		3	1	2				5	8
Bursal tumor		1	1					4	5
Flat foot		12	7	2	1		2	21	33
DISEASES OF THE CONNECTIVE TISSUE	18	348	248	94	7	1	16	606	972
Inflammation	10	136	101	37	4		4	131	277
Abscess	8	208	146	56	2	1	11	463	679
Gangrene		1					1	7	8
Œdema		3	1	1	1			3	6
Emphysema								2	2
DISEASES OF THE SKIN	21	421	271	133	7		31	2,310	2,752
Erythema		4	1	3				14	18
Pityriasis rosea		2		2					2
Urticaria		13	12				1	78	91
Prickly heat		2	2					27	29
Eczema	3	35	18	16	1		3	459	497

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
DISEASES OF THE SKIN—Continued.									
Impetigo		9	9					20	29
Pityriasis rubra		3		2			1	7	10
Prurigro								1	1
Lichen								3	3
Psoriasis		9	3	2	2		2	37	46
Herpes		4	2	2				84	88
Zona	1	8	7	2				47	56
Pemphigus		1	1					8	9
Dermatitis herpetiformis		2	1	1				14	16
Acne	1	5	3	1	2			78	84
Gutta rosea								1	1
Sycosis		1	1					13	14
Seborrhœa		1		1				2	3
Ichthyosis		1	1						1
Leucodermia								1	1
Chloasma								1	1
Alopecia								3	3
Chilblain		1	1					6	7
Ulcer	11	170	102	59	2		18	514	695
Boil	3	74	56	19			2	648	725
Carbuncle	1	30	20	10			1	56	87
Whitlow		19	10	9				64	83
Onychia		11	10				1	40	51
Tylosis								9	9
Corn		1		1				20	21
Cheloid								4	4
Wen		9	8	1				12	21
Milium								3	3
Hyperidrosis								7	7
Pruritus		4	3	1				24	28
Lupus	1	2		1			2	3	6
Bromidrosis feet								2	2
Injuries	**134**	**2,494**	**1,590**	**816**	**41**	**34**	**147**	**5,453**	**8,081**
GENERAL INJURIES	9	98	64	32		4	7	196	303
Effects of heat—									
Burns and scalds	4	55	39	16		1	3	162	221
Heat stroke		10	6	2		1	1	10	20
Sunstroke	1	1	2						2
Effects of cold		3	3					6	9
Effects of chemical irritants and corrosives		1		1				9	10
Multiple injury	4	18	9	10		1	2	9	31
Suffocation		2	1				1		2
Exhaustion		4	4						4
Shock		4		3		1			4
LOCAL INJURIES	125	2,396	1,526	784	41	30	140	5,257	7,778
Contusion of nerves		3	1	2				3	6
Wound of nerves	1	1	1	1					2
Rupture of veins		1	1					1	2
Contusion of kidney		1		1				1	2
Contusion lymph glands		1	1						1
Contusion of muscles		7	3	4				20	27
Strain of muscles		12	11	1				78	90
Rupture of muscles		1	1					2	3
Strain of tendons		1	1					2	3
Wound of tendons		1		1				13	14
Contusion of skin		2	2					15	17
Abrasion of skin		4	2	2				82	86
Wound of skin		9	2	6	1			30	39
Burn or scald of skin	5	112	68	36	1	3	9	205	322
Frostbite		25	21	4				30	55
Effects on the skin of irritants or corrosives		3	2	1				5	8
Abrasion of mucous membrane								5	5
Wound of mucous membrane		1	1						1
Burn or scald of mucous membrane		5	3	2				4	9

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
LOCAL INJURIES—Continued.									
Effects on the mucous membrane of irritants or corrosives								1	1
Contusion of scalp	1	11	7	4			1	23	35
Wound of scalp	6	86	62	24	2	1	3	208	300
Contusion of skull		3	1	2				2	5
Fracture of the vault of skull	2	14	6	4		3	3	3	19
Fracture of the base of skull		8		4		4		1	9
Wound of skull		1	1						1
Concussion of brain	1	5	4	1		1		2	8
Contusion of face		27	25	2				56	83
Wound of face and mouth	1	67	49	16	2		1	168	236
Foreign bodies in the nose, antrum, or other cavities								10	10
Fracture of facial bones	1	37	19	11	2	1	5	16	54
Dislocation of nasal cartilages		1	1						1
Burn or scald of mouth								1	1
Contusion of eyelid		4	3				1	25	29
Wound of eyelid		5	5					15	20
Wound of conjunctiva								4	4
Contusion of eyeball		6	3	3				5	11
Foreign bodies in the conjunctiva or cornea	1	4	4	1				86	91
Foreign body in eyeball		1	1					42	43
Wound of eyeball		7	4	2			1	4	11
Contusion of pinna		1		1				5	6
Wound of pinna		3		2			1	13	16
Rupture of membrana tympani	1			1				2	3
Wound of membrana tympani								1	1
Foreign body in external meatus								5	5
Contusion of neck		2		2				7	9
Wound of neck		4	3	1				7	11
Foreign body in the food passages								3	3
Contusion of chest		42	31	8	1	1	1	155	197
Dislocation of costal cartilages		3	1	2				7	10
Fracture of ribs	3	106	64	40			5	61	170
Fracture of sternum		1		1					1
Wound of parietes of chest		2	2					4	6
Gunshot wound	1	6	3	1			3	6	13
Contusion of back	3	67	52	17	1			95	165
Sprain of back	1	31	24	6	1		1	62	94
Wound of back	1	9	5	4		1		3	13
Fracture of spine		6	1		1	2	2		6
Dislocation of spine		3		2		1			3
Concussion of cord	2	4	4	2				1	7
Contusion of abdomen	1	10	8	1	1		1	14	25
Wound of parietes of abdomen		10	7	2		1		14	24
Contusion of the pelvis		4	3	1				11	15
Contusion of the perineum, scrotum, or penis		2	1	1					2
Wound of the male urethra, perineum, scrotum, testis, or penis		4	3	1				8	12
Rupture of urethra		2	1	1					2
Foreign body in urethra		1	1						1
Fracture or dislocation of pelvic bones		7	3	2			2	1	8
Contusion of testicle		3	2		1			6	9
Contusion of upper extremities	1	106	68	35	1		3	444	551
Sprain of shoulder		1		1				18	19
Sprain of elbow		2	1	1				8	10
Sprain of wrist	1	26	18	7	1		1	182	209
Sprain of hand		2			2			14	16
Sprain of thumb		1	1					6	7
Sprain of fingers								10	10
Wound of upper extremities	13	434	271	157	3	4	12	1,588	2,035
Wound of joint, upper extremities	1	6	5	2				7	14
Fracture of clavicle	1	27	11	10	1		6	10	38
Fracture of scapula		2	1				1	2	4
Fracture of humerus	2	25	11	10	1		5	5	32

TABLE IV.—TABULAR STATEMENT OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1910—Continued.

Diseases.	Number of cases.								
	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.	Total treated in hospital and dispensary.
LOCAL INJURIES—Continued.									
Fracture of bones of forearm—									
Radius	......	29	15	10	......	......	4	22	51
Ulna	1	17	10	7	1	......	......	9	27
Both bones	1	15	7	7	1	......	1	6	22
Fracture of carpus, metacarpus, or phalanges	2	37	15	21	......	......	3	58	97
Dislocation of clavicle	......	8	4	3	......	......	1	9	17
Dislocation of humerus	......	15	13	2	......	......	......	8	23
Dislocation of radius and ulna	1	7	4	4	......	......	......	3	11
Dislocation of phalanges of thumb	......	1	1	......	......	......	......	2	3
Dislocation of phalanges of fingers	......	1	......	1	......	......	......	6	7
Dislocation of carpus	......	......	......	......	......	......	......	2	2
Dislocation of metacarpus	......	......	......	......	......	......	......	4	4
Contusion of lower extremities	5	241	161	70	6	......	9	420	666
Sprain of hip	1	1	......	......	......	1	1	5	7
Sprain of knee	......	12	5	6	1	......	......	33	45
Sprain of ankle	10	172	117	58	......	......	7	215	397
Sprain of foot	......	6	3	2	......	......	1	6	12
Internal derangement of joints	......	......	......	......	......	......	......	1	1
Wound of lower extremities	17	201	132	66	3	1	16	449	667
Wound of joint, lower extremities	......	18	10	7	......	......	1	11	29
Fracture of femur	11	28	15	8	3	2	11	2	41
Fracture of patella	1	8	9	......	......	......	......	3	12
Fracture of tibia	5	24	19	7	......	......	3	2	31
Fracture of fibula	4	27	18	10	......	......	3	3	34
Fracture of tibia and fibula	11	55	30	25	1	3	7	17	83
Fracture of bones of foot—									
Of the tarsus	......	2	......	2	......	......	......	3	5
Of the metatarsus	2	13	7	6	......	......	2	1	16
Of the phalanges of the toes	1	8	5	2	1	......	1	3	12
Dislocation of femur	......	3	1	......	1	......	1	......	3
Dislocation of patella	......	1	1	......	......	......	......	......	1
Dislocation of foot	1	3	......	4	......	......	......	1	5
Dislocation of metatarsus and phalanges	......	1	......	1	......	......	......	......	1

TABLE V.—COMPARATIVE EXHIBIT—RATIO OF DEATHS FROM SPECIFIC CAUSES, 1901–1910.

Deaths from—	General average.	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
General diseases	48.83	45.60	44.01	48.06	49.49	53.46	51.52	52.17	44.92	50.00	49.03
Diseases of the—											
Nervous system	5.99	8.78	7.29	5.36	5.30	6.32	4.87	6.72	5.06	6.51	3.67
Circulatory system	11.13	11.87	12.23	10.72	8.76	11.88	11.16	10.47	12.06	8.74	13.39
Respiratory system	11.93	13.53	13.54	11.64	14.66	8.81	9.13	11.06	13.42	9.87	13.60
Digestive system	6.68	6.65	7.55	7.39	7.33	4.79	5.88	5.34	4.67	10.08	7.13
Genito-urinary system	6.43	5.70	4.94	6.65	6.72	5.74	6.09	5.54	10.13	7.85	4.97
Injuries	6.78	5.22	7.55	6.47	5.09	7.09	9.13	7.12	7.20	5.61	7.34
From all other causes	2.23	2.61	2.86	3.71	2.65	1.91	2.22	1.58	2.54	1.34	.87

TABLE VI.—NATIVITIES OF PATIENTS TREATED IN HOSPITAL DURING THE FISCAL YEAR ENDED JUNE 30, 1910.

Countries.	Number.
Total	14,278
Alaska	8
Argentina	5
Australia	32
Austria	155
Belgium	22
Canada	227
Cape Verde Islands	79
Chile	25
China	10
Cuba	5
Denmark	228
England	450
Finland	336
France	60
Germany	889
Greece	95
Hawaii	43
Ireland	610
Italy	80
Japan	35
Mexico	23
Netherlands	50
Newfoundland	93
Norway	1,130
Nova Scotia	172
Philippines	22
Poland	46
Porto Rico	35
Portugal	82
Russia	140
Scotland	170
Spain	169
Sweden	691
Switzerland	26
Turkey	21
United States	7,651
Wales	18
West Indies	98
All other countries	247

TABLE VII.—SURGICAL OPERATIONS, FISCAL YEAR 1910.

Operations.	Number of cases.
Total number of operations	**1,709**
TUMORS: Excision of	41
Adenoma, breast	1
Carcinoma	7
Epithelioma	6
Keloid	1
Lipoma	15
Osteoma, multiple	1
Papilloma	5
Sarcoma	2
Unqualified	4
CYSTS: Excision of	26
Cyst of larynx (drainage)	1
Cyst of neck	1
Dermoid	1
Sebaceous	22
Unqualified	1
FOREIGN BODIES: Removal of	5
From—	
Cornea	1
Eyeball	1
Upper extremity	2
Urethra and bladder	1
ABSCESSES: Incision and drainage	152
Connective tissue of—	
Axilla	5
Buttock	2
Face	7
Gluteal region	2
Ischeo-rectal fossa	8
Lumbar region	1
Lower extremity	22
Neck	12
Perineum	4
Perirectal	12
Peritonsilar	8
Periurethral	5
Psoas	2
Scrotum	4
Upper extremity	45
Liver	5
Unqualified	8
BLOOD VESSELS	48
Arteries, ligation for—	
Aneurism, femoral artery	1
Control of hemorrhage	3
Veins, for varix—	
Phlebectomy (unqualified)	30
Schede's operation	10
Barlow's operation	1
Babcock's operation	1
Incision and drainage for phlebitis with abscess	1
Transfusion	1
NERVES	3
Neurectomy	1
Removal of ganglion	1
Stretching	1
LYMPHATIC GLANDS	220
Incision and drainage for suppuration, etc.—	
Axillary	1
Cervical	6
Inguinal (bubo)	70
Submaxillary	1
Enucleation for suppuration or disease—	
Cervical	6
Inguinal (bubo)	132
Inguinal (plague)	1
Submaxillary	1
Unqualified	2
SKIN AND SUBCUTANEOUS TISSUE	98
Incision and drainage for—	
Carbuncle	10
Cellulitis	6
Inflammation	14
Wound, infected	17
Wound, lacerated	3
Cauterization for—	
Chronic ulcer	1
Excision of—	
Cicatrix	1
Congenital nævus	1
Ulcers	1
Operations for onychia	8

TABLE VII.—SURGICAL OPERATIONS, FISCAL YEAR 1910—Continued.

Operations.	Number of cases.
SKIN AND SUBCUTANEOUS TISSUE—Con.	
Skin grafting, for—	
Burn	1
Chronic ulcer	6
Contracture, repair of	1
Varix	1
Wound, larcerated	4
Wound, old, unhealed	1
Suture and dressing, for—	
Wound of—	
Lower extremity	2
Neck	1
Scalp	3
Upper extremity	6
Plastic resection for elephantiasis, leg and foot	1
BONES	111
Simple fracture—	
Reduction, splints or extension—	
Astragalus	1
Clavical	2
Colles	3
Femur	3
Humerus	5
Maxilla, inferior	2
Olecrenon process	1
Os inominatum	1
Phalanges	1
Pott's	3
Radius	3
Ribs	4
Tibia and fibula	6
Ulna	3
Unqualified	3
Vertebræ, 7 and 8 cervical	1
Bone exposed and wired—	
Femur	3
Humerus	2
Maxilla, inferior	5
Patella	3
Radius and ulna	1
Tibia and fibula	2
Compound fractures—	
Reduction, wiring, splints—	
Elbow	1
Fibula	1
Maxilla, inferior	1
Phalanges	2
Pott's	1
Tibia and fibula	1
Tibia	1
Nonunion—	
Wiring and splints—	
Femur	2
Humerus	1
Patella	1
Phalanx	1
Tibia and fibula	2
Reset for deformity—	
Femur	1
Resection or currettage of portion of bone for injury, disease or necrosis—	
Ankle joint	1
Clavical	2
Femur	3
Frontal bone	1
Humerus	2
Ilium	1
Maxilla, inferior	4
Metacarpal	3
Metatarsal	1
Phalanges	4
Rib, cervical	1
Ribs	2
Tibia	3
Unqualified	7
Incision and drainage, for periostitis	2

Operations.	Number of cases.
JOINTS	33
Reduction of dislocation, of—	
Ankle	2
Clavical	1
Elbow	2
Hip	3
Humerus	1
Maxilla, inferior	1
Radius	1
Semilunar cartilage (excision of cartilages)	1
Wrist	1
Arthrotomy and drainage—	
Elbow	3
Knee	2
Unqualified	1
Removal of loose bodies—	
Knee	1
Arthrectomy (resection) for—	
Halux valgus	1
Old dislocation	1
Tuberculosis, ankle	1
Tuberculosis, elbow	2
Tuberculosis, shoulder	1
Aspiration of joint—	
Knee	3
Unqualified	4
Forced extension and passive motion for ankylosis—	
Knee	1
MUSCLES, TENDONS, AND FASCIA	9
Tenorrhaphy	4
Tenotomy	2
Lengthening tendons—	
Tendo achilles	1
Curettage, for—	
Necrosis, tendo achilles	1
Reduction dislocation, of—	
Peroneal tendons	1
BURSAE	10
Incision and drainage, for—	
Inflammation	9
Excision	1
AMPUTATIONS	78
For disease or injury of—	
Fingers	54
Hand	2
Forearm	4
Leg	3
Thigh	5
Toes	10
SKULL	17
Decompression, for—	
Glioma	1
Fracture	2
Trephining, for—	
Abscess	1
Epilepsy	1
Paralysis of arm	1
Mastioditis	4
Frontal sinusitis	3
Maxillary sinusitis	3
Opening mastoid cells	1
SPINE AND SPINAL CORD	3
Curettage and drainage, for—	
Pott's disease	1
Lumbar puncture, in—	
Serous meningitis	1
Syphilis, secondary	1

TABLE VII.—SURGICAL OPERATIONS, FISCAL YEAR 1910—Continued.

Operations.	Number of cases.
FACE, NASAL CAVITIES, AND MOUTH	47
Excision of—	
Adenoids	2
Fistula, salivary	1
Nasal septum	4
Nasal polypus	3
Tonsils	33
Cauterization of—	
Pharyngitis	1
Curettage of—	
Nasal sinus	1
Extraction of teeth	2
EYE	16
Enucleation of eyeball, for—	
Injury	1
Shrunken eyeball	1
Panophthalmitis	1
Extraction of lens	1
Excision of—	
Chalazion	2
Lacrymal gland	1
Pterygium	1
Iredectomy, for—	
Glaucoma	2
Synechia	1
External canthoplasty, for—	
Symblepheron	1
Probing and slitting—	
Stricture, puncta	3
External tenotomy, for—	
Strabismus	1
EAR	2
Perforation of membrani tympani, for—	
Suppuration middle ear	2
LARYNX	1
Tracheotomy	1
THORAX	15
Thoracentesis, for—	
Empyema	1
Hydrothorax	1
Pleurisy with effusion	8
Resection of ribs, for—	
Empyema, drainage	5
ABDOMEN	291
Paracentesis, for—	
Ascites	3
Abscess of liver	3
Abdominal section, for—	
Appendectomy, closure	56
Appendectomy, drainage	16
Cholecystectomy	1
Cholecystotomy	2
Cholecystostomy	1
Colostomy	3
Drainage, abscess	2
Enteroenterostomy	3
Enterostomy	2
Freeing adhesions	3
Gastroenterostomy	2
Gastrostomy, rupture of aortic aneurism into stomach	1
Removal external iliac glands	1
Resection of intestine	3
Enterorrhaphy, for—	
Fistula	3
Perforating ulcer of duodenum	1
Perforation by cancer	1
Typhoid perforation	1
Exploration—	
Diffuse lipoma of mesentery	1
New growth	2
ABDOMEN—Continued.	
Herniotomy—	
Inguinal hernia—	
Andrews' operation	1
Bassini operation	164
Ferguson operation	5
Halsted operation	1
Mayo operation	2
Modified operation	1
Rectus transplantation	1
Strangulated inguinal hernia	1
Umbilical hernia	1
Ventral hernia	3
RECTUM AND ANUS	108
Hemorrhoids—	
Internal—	
Clamp and cautery	14
Ligature	4
Ligature and excision	11
External—	
Clamp and cautery	2
Excision	3
Incision	2
Ligature and excision	8
Mixed—	
Clamp and cautery	7
Dilatation sphincter ani	1
Ligature and excision	8
Ligature and cautery	1
Fistula in ano—	
Excision	4
Incision	43
URINARY BLADDER	4
Perineal cystotomy, for—	
Drainage	2
Suprapubic cystotomy, for—	
Calculus	2
URETHRA	52
Organic stricture—	
External urethrotomy	6
Gradual dilatation	17
Internal urethrotomy	18
Perineal section	2
Rupture or abscess—	
Internal urethrotomy	2
Perineal section	2
Urethral fistula—	
Curettage	1
External urethrotomy	2
Urethral calculus—	
Removal by incision	1
Plastic operation, for—	
Hypospadias	1
MALE ORGANS OF GENERATION	300
Penis—	
Circumcision, for—	
Chancroid	4
Phimosis	157
Syphilis, primary	2
Ulcer	11
Venereal warts	1
Dorsal incision, for—	
Paraphimosis	10
Phimosis	3
Amputation, for—	
Chancroid	1
Necrosis	1
Cauterization, for—	
Chancroid	7
Incision and drainage, for—	
Abscess	2
Ulcer	2
Operations for varicocele—	
Ligation, cutting veins	3
Phlebectomy	30

TABLE VII.—SURGICAL OPERATIONS, FISCAL YEAR 1910—Continued.

Operations.	Number of cases.	Operations.	Number of cases.
MALE ORGANS OF GENERATION—Cont'd.		FEMALE ORGANS OF GENERATION	4
Operations for hydrocele—			
Excision of sac	7	Oöphorectomy, for—	
Incision	9	Tubo-ovarian abscess	1
Inversion of sac	5	Salpingectomy, for—	
Tapping	7	Inflammation	1
Unqualified	13	Perineorrhaphy, for—	
Volkmann's method	1	Laceration of perineum	1
Scrotum—		Suspension of uterus	1
Incision and drainage, for—			
Haematocele	2	GUNSHOT WOUNDS	5
Testicle—			
Castration, for—		Neck	2
Abscess	3	Skull	1
Chronic orchitis	1	Thigh	2
Gumma	1		
New growth, malignant	2	GANGRENE	10
New growth, nonmalignant	1	Amputation of—	
Tuberculosis	6	Finger	3
Undescended testicle	1	Foot	1
Incision and drainage, for—		Leg	1
Abscess	3	Toe	5
Prostate—			
Incision and drainage, for—			
Abscess	2		
Perineal prostatectomy, for—			
Hypertrophy	2		

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